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NEWSPAPER

DP Nightmare

By Nancy French
Of the CW Staff

Christmas holiday travel arrangements, which under normal conditions can produce headaches for passengers and travel agents alike, became a nightmare this year when United Air Lines was struck.

The walkout by machinists flooded the computer-based communications/reservations systems of the entire airline industry with millions of messages a day aimed at rebooking passengers on alternate flights.

Passengers who were lucky enough to book flights on other carriers arrived at airports all over the country with tickets in hand only to find their names were not on the passenger lists for the flights they had booked, according to Donald Sohn, president of Heritage Travel Service of Cambridge, Mass.

While the system didn't collapse, the crisis gave industry officials a taste of a 24-hour-a-day peak load operation they haven't experienced before, one official said

Airlines sell space not only on their own flights, but also on all other carriers' flights by communicating with each other's computers via Arinc private communications network operated for the airline industry by Aeronautical Radio, Inc., Sohn explained The network is largely high-speed Teletypes.

When a flight is nearly booked, the airline's computer system sends an "inhibit message" to any travel agent or other airline that attempts to book space on that flight, telling them not to sell any more space.

"Somehow, these messages didn't get through," Sohn said. "Flights were oversold, and no one really knew it until clerks printed out lists of ticketed passengers and discovered the problem."

Secondly, according to Sohn, messages that were queued up waiting to

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IBM, Two Partners Slate Satellite Service for '79

By Ronald A Frank
Of the CW Staff

WASHINGTON, D.C. IBM and its partners will begin providing domestic satellite services to users in 1979, according to a proposal filed last week with the Federal Communications Commission (FCC).

IBM is one of the major partners in Satellite Business Systems (SBS), which will carry on the earlier proposals made by CML Satellite Corp The other partners are Comsat General Corp and Aetna Life & Casualty

The SBS application complied with FCC restrictions set forth in early 1975 that gave IBM and Comsat General several alternative ways to enter the satellite business [CW, Feb. 5] IBM and Comsat General chose to enter with a third partner, which was Aetna [CW, Oct 8].

The SBS satellite services will operate in the 12- and 14 gHz bands offering all-digital services combining voice, digital and image communications, SBS told the commission. Included will be "direct access to fully switched, multimegabit/sec data transmission."

The SBS satellite network was described as "substantially different from those of other domestic satellite" carriers Instead of relying on a few large earth stations and interconnection with existing carrier landlines, SBS said its system will provide "much more than just point-to-point bandwidth.

"In particular, SBS proposes to provide multipoint private networks with switched and dedicated capabilities consisting of voice, data and image communications services dynamically adaptable to a customer's needs.

"Within the parameters set by the customer, the system will dynamically allocate transmission capacity among the various classes of traffic among the [user's] network locations," SBS said.

The system will use "small earth stations incorporating innovative modulation and access equipment located on the customer's premises These small earth stations will reduce the customer's dependency on local communications access facilities," the SBS application said.

"Analog voice traffic will be converted to a digital format and will be combined with data and image traffic as part of a

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Bad Blood Between Attorneys?

Courtroom Clash Disrupts U.S. vs. IBM

By Edith Holmes
Of the CW Staff

NEW YORK Contentious tactics or genuine animosity?

Chances are that both motivations were behind a recent courtroom debate among attorneys for the government, lawyers for IBM and the judge hearing the U.S. vs. IBM antitrust case here

Touched off by the government's objection to IBM's "vague" use of the terms "equipment" and "electronic data processing manufacturers" in its cross-examination of a former RCA employee, the discussion involved all the principal participants in the proceedings, included a certain amount of name-calling and, so far as such interests as "truth" and "justice" were concerned, wasted 20 to 25 minutes of taxpayers' and IBM stockholders' time and money

Government attorney Peter Goldberg had objected to IBM counsel Paul Dodyk's undefined use of "equipment" and "EDP" in his examination of Edwin S. McCollister, once with RCA and now in charge of Burroughs' international market development

Goldberg had made the objection before, and the IBM attorney had spent two hours going through the government's direct examination of McCollister, asking the witness to define every reference to these terms.

The defense had referred to the definitions for "equipment" and "EDP" used in a glossary of DP terms entered jointly by the parties over a month ago and stated it would intend those definitions by its use of the words unless it stated otherwise

Nevertheless, Goldberg objected to the use of these words once again, and Judge David N Edelstein said from the bench, "I think that's an appropriate objection I am really getting fed up as to this I can't understand why we can't define these terms as they are intended to be used, and I insist upon it

"Whatever your definition may be, indicate to this witness what at least you mean 'equipment' or 'electronic data processing,' " he said.

Dodyk referred to the time spent attempting to define these terms as they were used on direct

"Yes, and I had no difficulty understanding most of his answers," the judge responded "I read them in context but, if there is going to be any question about it, I insist that we define our terms."

"Your Honor, I simply fail to under-

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Independent Authority to Regulate UK Data Banks

By Joseph Hanlon
Special to Computerworld

LONDON An independent authority will regulate both government and private data banks here, the government announced last month in its long-awaited white paper, "Computers and Privacy."

The authority "will consist of people with knowledge and experience of computers," the white paper noted

"The time has come when those who use computers to handle personal information can no longer remain the sole judges of whether their own systems adequately safeguard privacy," the white paper declared

The paper has been the center of a bitter three-year battle in the corridors of Whitehall [CW, Dec. 11, 1974], and the civil servants have won a number of concessions.

Their strongest victory is that despite the view that the time for action has come all that is to happen now is the appointment of another committee, the Data Protection Commitee

The committee, members of which will be appointed this month, will report in 18 months on possible legislation, including privacy guidelines and methods of establishing the proposed data bank authority. Thus, any legislation will be at least three years away

But the privacy advocates won the three most important points The government admi. ed data banks need regula-

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Seattle Ends Bidding Dilemma By Accepting County's Free Offer

Special to Computerworld

SEATTLE Several months after two contenders for a facilities management contract effectively knocked each other out of the running, Seattle has accepted surrounding King County's offer to share its DP facility for three years free

The offer was almost too good to be true, and skeptical city officials were at first reluctant to accept it. "There's no such thing as a free lunch," Councilman Randy Revelle was quoted as saying in the local press

But King County Administrator Charles Collins apparently managed to allay the City Council's fears He told the council the county has surplus computing capacity and indicated the offer could eventually lead to a shared city/county center

In addition, Collins said "cooperation between the governments to date has been at best discouraging and at worst disgraceful "

Joining with the county means Seattle will begin utilizing one of the county's twin 370/155s and gradually convert from the city's present NCR 251 machine language shop.

With the offer, Seattle hopes to lop $300,000 off its projected 1976 DP budget of about $5 million

The City Council's acceptance of the county's offer brought an end to a controversy begun when Computer Sciences Corp won the bid for a facilities management contract from the city Boeing Computer Services, a local firm, protested the decision, charging improprieties in the selection and award process [CW Nov 12]

After several weeks of City Council hearings, both bids were rejected because of "flaws in the competitive bidding process" and "attempts to influence city evaluators improperly "

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Private Sector Not Excluded

Outside Authority to Regulate UK Data Banks

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tion; it accepted the proposal that the regulatory authority should be independent of the government; and it agreed the authority's domain would include both government and private data banks.

The problem will now be the membership of the committee and the form it picks for the authority. The white paper says the committee is to consider two different approaches: either registration and licensing or merely investigation of complaints.

The former is followed in the U.S. and Sweden and even in Britain, which has a Consumer Credit Act that involves registration of credit bureaus.

The second choice appeared to contradict an earlier statement in the white paper that "the existence and purpose of . . . information systems should therefore be publicly known, as well as the categories of data which they handle, what they do with the data and which interests have access to the data."

The second option is seen as a sop to the civil servants, giving them another chance to argue against outside control of government computers.

The core of their argument appeared in a companion civil service paper, "Computers: Safeguards for Privacy," which discussed the government's more than 220 computer data banks.

This document argued that the parliamentary ombudsman already has the power to investigate breaches of confidence with respect to government computers.

Thus, if the Data Protection Committee can be convinced to take the second choice, the civil servants will then argue the authority need not apply to government.

The committee is also to establish "a set of objectives to set standards governing the use of computers." Although these will be included in the law setting up the authority, they "need not be enforceable by civil or criminal processes."

Rather, they are likely to be that curious British object, the code of practice. Codes are not enforceable in law, but code violations are admissible in court as evidence of misconduct.

For example, many driving regulations which are incorporated in law in the U.S. are only in the "Highway Code" in Britain. Violations of the code are used as evidence of dangerous driving, rather than treated as offenses.

But the white paper stressed the objectives "must be more than mere declarations of broad principle and must set the standards with a sufficient degree of particularity."

The objectives are to include the right of people to know about data banks and to access and correct files. But the paper emphasized "the operator of the system should be responsible for ensuring its accuracy and relevance."

Other objectives are that people asked to provide data should know for what purpose it is to be used and that personal information should be collected only if it is necessary for the declared purpose.

Finally, transfers of data from one data bank to another should not be permitted "unless they are expressly sanctioned by law or agreement, or are subject to the scrutiny and control" of the data protection authority.

But that data protection authority will be severely limited from the start by the exclusion of all the data banks that have been most controversial from some or all of the rules.

Police and national security data banks are totally outside its purview. Medical and social work records will not be shown to people if a doctor or social worker considers this in the subject's "best interests."

IBM and Partners File With FCC To Start Satellite Service in '79

(Continued from Page 1)

single multiapplication network able to handle virtually all of the customer's internal communications."

The high bit rate will allow normal telephone quality on the digitized voice transmissions, the application said, and the rooftop earth stations will provide access to high transmission speeds without requiring the customer to rely on wideband terrestrial facilities.

The network will utilize Time Division Multiple Access (TDMA) which will handle a bit stream of "tens of millions of bits per second" and make it impractical to intercept communications, SBS said.

Privacy equipment can be added to digital and voice communications in the system. "Demand assignment" techniques will be used for "advanced data processing applications," SBS said.

Preoperational Network

In order to develop its satellite capabilities, SBS will establish a preoperational network to serve seven IBM locations for in-house communications.

The first two sites in this internal network will be at IBM locations in Poughkeepsie, N.Y., and Los Gatos, Calif. The system will use facilities supplied by existing domestic satellite carriers operating in the 4- and 6 gHz bands.

When the full SBS system begins serving customers in 1979, "all access ports will be compatible with conventional telephone interfaces for voice-grade traffic" and "with established industry standards in the case of digital data inputs. This will allow customers to connect their existing terminal equipment, provided it adheres to such standards," the application said.

SBS access ports will accept bit streams regardless of their character code, message content or line protocol. Data line control techniques will be external to the SBS system facilities and under the control of users, SBS said.

The SBS earth stations will be about 16- or 23 ft in diameter and can be sited on rooftops or open areas. Modulation and access equipment at each station will perform digital coding of voice-grade signals, echo suppression, switching and multiplexing.

The system will include two satellites, one primary and one backup, each with an expected seven-year life. Each satellite will have eight transponders and service will be available in the 48 contiguous states.

The SBS filing apparently was a "radio application," according to an FCC staff source. This means it did not contain as much detail about types of services to be offered as would be required in a so-called "214" application.

If the filing is accepted by the commission, interested parties will have 30 days to respond. It is expected this response period will include most of the month of January, the FCC source said.

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Courtroom Clash Disrupts U.S. vs. IBM Antitrust Trial

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stand why it is that in the context of the cross-examination the word 'equipment' is so much more difficult to understand than it was during direct," the IBM attorney said.

"You are being smart-alecky, aren't you? . . .I don't understand your questions as they are being framed. Is that sufficient? I see no reason why we have to have slippery use of terms," Edelstein stated.

With that, lead IBM counsel Thomas D. Barr rose to his feet. Barr said he had to object to the judge's characterization of counsel for IBM as "slippery."

"I think Your Honor is disrupting the cross-examination of this witness. I think Your Honor started disrupting the cross-examination of this witness this morning and I ask Your Honor, please, in the interest of justice, to refrain from doing it," Barr said.

Judge's Conduct

After dealing specifically with the problem posed by the word "equipment," Barr expanded the issues being discussed to include the judge's conduct during all cross-examinations. He said Edelstein was being led into error by government counsel.

"Your Honor has repeatedly interrupted and instructed the witness . . . during the cross-examination, about how to answer questions. On the other side of it, during direct examination Your Honor has allowed the witnesses to speculate and to surmise and to answer on the basis of hearsay, I believe, Your Honor, far beyond anything I have ever seen before," Barr said.

The defense attorney asked that, accordingly, the scope of the cross-examination in this case be permitted to be "extraordinarily broad . . . the broadest, most uninterrupted kind of cross-examination known to any court in this country."

The judge suggested even such a cross-examination must be "consistent with justice and consistent with fair play." He added that any error committed in this trial would be preserved on the record.

Finally, the court commented Barr's statement constituted "a great tactic. It is a great method for attempting to impugn the judge's fairness."

Specter of Retrial

Barr then raised the specter of having to retry the case should gross error be committed.

"Government counsel who have the responsibility only for the trial of this case – they won't have any responsibiilty for the appeal, they don't care what happens on the appeal – are leading the court into error and they are going about that, I believe, in a way which is necessarily going to result in reversal of any result in this case," he stated.

The suggestion that government counsel "didn't care" brought lead Department of Justice attorney Raymond M Carlson to his feet as well. He stood a full five minutes before saying anything while Barr and Edelstein continued their discussion of potential error – by the court, by IBM, by the government.

Throughout, Barr continued to imply the court had shown favoritism toward the government by allowing unlimited direct examination of a witness and then limiting cross.

Carlson's comments did not help negate this impression. "I rose to address the court on one point," he said, "and that is that [IBM] counsel, in his long and involved statement, has impugned the integrity of government counsel. I resent it very much."

He added he was in the courtroom every day precisely because he does have responsibility for the appeal. "I am not here as an observer. Mr. Barr very well knows that."

Carlson backed down, however, when Barr stated the government attorney had told him on numerous occasions that " 'I have no responsibility for the appeal, that is not my ball park.' "

Commenting on the tone of the discussion toward its conclusion, Edelstein remarked, "the most discordant note about this entire colloquy is the fact that you and Mr. Carlson at the moment are somewhat displeased with each other and I just don't think that is necessary.

"You have worked too long, you have cooperated over a long period of time, and I just don't think this discordant note ought to be precipitated in this trial."

But this was not the first "discordant note" between the parties, nor is it likely to be the last. One long-term court observer has commented repeatedly he has never seen attorneys remain angry at each other once the judge leaves the room as they have in this trial.

Strike at Christmas Brings DP Nightmare

(Continued from Page 1)

be transmitted by Arinc were lost because "message queues got overfull."

Paul Luxion, a spokesman for Arinc in suburban Washington, D.C., said it was not an Arinc problem but rather one in which the airline industry's entire communications system was inundated.

Arinc, which normally carries about a million messages a day, was moving twice that number during the entire crisis period, which began on Dec. 9 with United's three-week cancellation of service.

This massive cancellation may have caused part of the problem, according to Glen Belden, United Air Line's president for computer and communications services based in Chicago.

"Normally during a strike we cancel flights for a three-day period and move that cancellation up one day at a time. This time, in the interest of the public, we decided to cancel all service for 15 days.

"Our reservations clerks, who are nonunion employees, stayed on duty helping United passengers book flights on other carriers," he explained.

As an indication of the numbers of seats affected by the cancellation, United carries some 90,000 passengers per day, with 80% to 90% of the next 30 days' reservations on the books at all times, Belden said

The cancellation generated a separate message for every name record in the reservations data base and, in cases where the space was sold by other carriers, that information had to be sent back to the carrier which originally booked the space.

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Jury Brings In Verdict for User, Against IBM in '75

By Molly Upton
Of the CW Staff

PROVIDENCE, R.I. – What began a couple of years ago as an effort by IBM to collect unpaid bills for machine rental and systems engineering services developed into a jury verdict awarding the user $11.4 million and IBM its overdue payment of $68,453.

The turnaround resulted after a three-month trial of both IBM's case against Catamore Enterprises, Inc., a jewelry manufacturer here, and Catamore's counterclaim.

Catamore had charged IBM with breach of contract and warranty as well as with overselling, fraud and negligence.

The fraud charges pertained to the implications to the user of unbundling.

Attorneys for IBM have called the verdict "erroneous" and have asked Federal District Court Judge Raymond J. Pettine to overrule the jury verdict.

But Pettine upheld the jury verdict, and IBM intends to file with the First Circuit Court of Appeals.

While the case would seem to provide several precedents, it did not clearly establish fraud on the part of IBM.

The jury verdict merely established the amount of damages. It did not award punitive damages, possible only if the jury found IBM guilty of fraud.

What the case did establish is that an unhappy user can succeed in taking a vendor to court, charging the failure of his machine to perform as specified damaged his business both on an actual and on a projected basis

The tale Catamore told in court was that of a naive first-time user told by an IBM salesman that a specific machine, a 360/20 BC-4 ordered in September 1968, would perform production control as well as inventory, order entry, invoicing, accounts receivable and accounts payable.

IBM upgraded the order to a DO-5 in May 1969, Catamore said.

Catamore was later told it needed a 360/25 for the job, which was ordered in March 1970.

The jewelry maker contended it never received an operational production control system for which it had contracted and with which it intended to expand its business.

Review and Forecast

Catamore attorneys indicated the firm had been told unbundling would be a cost advantage to the user, whereas IBM management plans indicated the firm expected revenue gains from charging for services rendered.

The judge accepted as admissible evidence oral agreements between Catamore and IBM pertaining to systems engineering work because he ruled these agreements were separate and distinct from the written contracts for machine services.

IBM, represented by attorneys from the local firm of Edwards & Angell, fought this motion and decision constantly, arguing the oral agreements were covered by the written notices of changes in the bundling policy.

Privacy Still an Issue, But Hoopla Has Died

By Nancy French
Of the CW Staff

Last year at this time all eyes turned to Vail, Colo., where the vacationing President Gerald Ford was signing into law a number of eleventh hour bills, one of which was the Privacy Act of 1974.

That act guaranteed citizens for the first time that federal agencies would protect their personal information from access by unauthorized individuals and that "data subjects" would be allowed to access and correct their records upon request.

The law covered information practices in the private sector only to the extent that it provided for the establishment of a Privacy Protection Study Commission to review information handling in the private sector and recommend appropriate legislation to Congress for enactment in two years.

Although included in many earlier versions of the Privacy Act, law enforcement records were eliminated from protection by the new federal law.

Now, one year later, there is no hoopla and little publicity surrounding the privacy issue. Instead, there is only the sound of government bureaucrats grinding away to implement the law and make it work.

While Ford was criticized by many for being slow to appoint members to the Privacy Protection Study Commission, the commissioners were named in June, and that body went to work immediately.

Today, along with the seven commissioners, its offices are staffed by 17 officials whose responsibilities range from preparing issue papers for the commissioners and soliciting witnesses for hearings that will help determine how the commission spends the remaining 18 months of its life to typing letters and making travel reservations.

The Office of Management and Budget, which promised guidelines for implementing the Privacy Act early in the year, finally provided them in July, long after federal agencies had begun writing their own rules and regulations with only some preliminary notes and the act itself to guide them.

On Aug. 27, in the thickest issue ever published on a single day, the *Federal Register* carried all the agencies' rules and regulations together with a list of all existing systems of records.

The *Register* showed government agencies used 700 computer systems to process personal information.

States Start to Act

On the state side, Minnesota, the first state to pass a privacy law covering the information-handling practices of state and local government agencies, amended its law to ease the restrictions placed on local governments. The action was taken when officials and legislators realized such jurisdictions held no personal information and the requirement that they report all systems they had was an unnecessary burden.

The Minnesota Legislature also rede-

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With Death of FS in '75

Predictions of Future IBM Offerings Remain Clouded

By E. Drake Lundell Jr.
Of the CW Staff

It's easy to predict that IBM will announce new products in 1976, but the old crystal ball gets decidedly cloudy when it comes to predicting what they might be.

In 1975 the firm killed the title of Future Systems (FS) even before it had graduated to the product stage – but just because the title was dropped does not mean the firm dropped its plans for a new line of equipment, predicted for 1976 in internal IBM documents released publicly in the Telex case.

Under the original plans as revealed in those documents, the FS was to be a completely new line of computers that would obsolete – but be compatible with – the 370 line.

The FS line was to have featured a new operating system, dubbed System Q internally, that would have had several features designed to make the systems easier to use by nonprogrammers and leading eventually to "programmerless systems."

These full-blown systems, as discussed in the Telex papers, would have been a significant advance over the present state of the art and would have been designed for a life of at least 15 years before replacement systems would have been introduced, rather than the present five- to six-year life cycle.

Question Changed

When IBM admitted it had dropped the FS designation, the firm emphasized product development was, of course, continuing.

So the question became: "Did IBM just drop the name – or did it drop the development of FS-like systems?"

And IBM's not telling.

It is clear several design efforts within the firm were halted around the time the FS designation was dropped, which would lead to the conclusion that development on that system was also dropped – right?

Well, maybe.

IBM, when it is working on new projects and systems, often has several parallel design and development efforts going at one time, often in complete isolation from each other. So possibly the projects that were dropped were only the ones with the least chance of payoff in the near future, or perhaps another design team had come up with a more cost-effective solution to the same problems.

Review and Forecast

So IBM could still be working on a revolutionary new system for introduction in 1976; certainly the firm's shipment figures and projections would seem to indicate a new system is needed to continue the firm's revenue and profit-growth picture during the coming year.

But there may be another solution to the problem of continuing growth and shipment levels. That would be the introduction of an interim or stepping-stone series of computers, either within the 370 designation or under another nomenclature.

Most industry pundits now expect IBM to opt for this approach – the introduction, during 1976, of a group of computer systems that gently extends the 370 line, but that does not depart as radically from the present state of the art as the FS series would have.

Under this scenario, the firm would use the new 1976 models as a bridge to the full FS-type system that would become available in the early 1980s.

The new systems, current thinking holds, would provide successor models to the upper end of the 370 line – possibly with the announcement of a 370/178 – and for the mid-range with 138 and 148 models.

These additions would be enough to ensure IBM remained on an upward curve in revenues and profits, the thinking goes, and would also enable IBM to get new machines in the marketplace without the necessity of having to complete work on its completely new series.

Of course, there are still many in the industry who expect the full blown FS system – possibly dubbed the 380 series – to be introduced next fall with features outlined in the Telex papers.

And then there is even a third group of IBM watchers who combine the positions of the other groups. These feel that IBM will essentially introduce just an upgrade to the 370 line, but that the firm will call it by a new name in order to assure users the line will not be just a bridge, but rather a good investment for the future.

Only the planners in IBM know for sure what will be coming out this year, and they're not talking.

Telex Case: Out of Court, But Not Out of Mind

By E. Drake Lundell Jr.
Of the CW Staff

After a three-year battle through the courts, the Telex vs. IBM antitrust case ended as most suits against the industry leader: with an out-of-court settlement.

The question for 1976 concerns the possible repercussions of that settlement on other peripheral manufacturers who had filed similar suits against IBM in the wake of the initial Telex victory in its action.

The 1975 action in the case was all downhill for Telex, which had won a stunning victory against IBM in 1974 when IBM was found guilty of monopolization for the first time ever in a federal district court.

But, from then on, Telex had nothing to crow about, since that decision was overturned by a federal appeals court while the IBM counterclaim charging Telex with theft of trade secrets was allowed to stand.

Then, late in the year, Telex blinked and decided it could not risk its corporate future on the chance of the Supreme Court hearing its case and ruling in its favor.

If that court had not heard the case or had ruled against Telex, the firm would have been forced into bankruptcy by the $18.5 million it would have owed IBM on the trade-secret charges.

With its withdrawal of the appeal to the Supreme Court, Telex was removed as a factor in the antitrust arena, and its case, along with its short-lived victory, became history.

Past Only a Prelude

But the past is prelude, according to philosophers, and in this instance, the history of the Telex case may have a bearing on the host of other similar actions filed against IBM in the wake of the initial Telex victory.

At year end, all others in the arena emphasized their commitment to continue their cases against IBM and, if the present trial schedule holds, the cases will be heard starting next summer.

It is likely that the actions of California Computer Products, Inc. (Calcomp), Memorex Corp. and Sanders Associates, Inc. will go to trial, since all of them allege charges that are far broader than the ones in the Telex case.

However, the cases of such firms as Hudson General Corp. and Transamerica Corp. are fairly limited to the issues brought up in the Telex suit, and many observers feel that they will never go to trial, particularly if IBM is willing to offer some incentive to settle.

So, while 1975 saw the end of the first plug-compatible peripherals case against IBM, it could turn out that 1976 will see a renewal of antitrust action against the firm on similar charges.

And the 1976 action could well prove to be more definitive than the Telex case, which was cut off before a final resolution.

Hoopla Around Privacy Has Died

(Continued from Page 4)

fined the categories into which personal records were to be classified. To the categories of public information, which is open to all, and private information, which is open only to the data subject and public officials with a need to know, the state added a third: confidential information, to protect medical and psychiatric records which, if open to the data subject, may cause him damage.

Two other states – Utah and Arkansas – passed fair information practices laws, also limited to information handling by government agencies, and brought the number of states with such laws to three.

In California, where a similar measure passed both houses of the Legislature, a veto by Gov. Jerry Brown prevented its becoming law.

In Oregon, a bill covering privacy of criminal records was made law, but the ill-conceived measure was killed three days later because it went too far, legislators found out. Under the law, a wife couldn't even learn if her husband had been arrested.

So, looking back at 1975, much has been done in the area of privacy, but much remains to be done.

Perhaps a year from now, legislators will be aware of the issues involved in protecting individuals from abuses resulting from practices carried on in the private sector, and a new law will be in the wind.

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CW1210

DP in Education Continues Strong But Silent Growth

By John Hebert
Of the CW Staff

A strong but relatively silent demonstration of the existence and growing acceptance of computer capability in the field of education has clearly occurred during the past year.

The singular, most important event was the completion of a National Science Foundation-funded study of computing activities in secondary education known as Project Case and conducted by the American Institutes for Research (AIR).

The study repeated the first comprehensive survey of computing activities in secondary schools (completed by AIR in 1970) because of a lack of such information available "for the analysis of trends and estimates of future growth and directions," the report said.

The study supplied a wealth of information about the second frontier of educational computing and supplied insight into the first – higher education – which had exploited the potential advantages of computers long before public schools.

Use in Higher Education

Recent figures of computer usage in centers of higher education are not available. The last assessment was in 1970, and there were reports this year of renewed interest in the subject. However, no funding for such a massive undertaking has been appropriated.

In the university arena, computers were used in 3,000 to 5,000 U.S. college courses as of 1970, according to Martin Rubin, a research scientist at Human Resources Research Organization (Humrro).

The actual expenditure for university computing through 1971 was about $500 million, Rubin said. Hardware expenditures alone through 1980 will be around $1 billion, he estimated.

The study of secondary schools represented an accurate barometer by which to gauge the climate and atmosphere of educational computing and, in the process, qualified a report in *Computerworld* on the significance of the decrease in federal funding for computer-aided instruction in recent years [CW, June 4].

The cost of instructional computing at any level of education has been a thorn in the side of educators wishing to utilize the capabilities of computer technology.

And a decrease in federal funding may appear to cast an unwelcome shadow on an otherwise hopeful future.

However, local and combined local and state sources of funding were responsible for 84.9% of instructional computing activities found in the U.S. secondary schools surveyed, with local funding taking the brunt of support at 63.3%, the AIR study found.

Another hopeful comment on the problem of costs cited by the AIR study was that the cost of computing has decreased in the past four years.

Directly related to the Project Case results was a report on the current status of the Minnesota Educational Computer Consortium (Mecc) at the Association for Educational Data Systems convention this year.

Mecc was created by five Minnesota state agencies in 1974 to equalize instructional computing capabilities at all levels of education on a statewide basis, according to Dr. Kenneth E. Brumbaugh, state instructional coordinator of Mecc.

Mecc is a highly organized body with policy direction and goals defined by the users.

Review and Forecast

This cooperative effort promotes sharing of personnel, library materials, computing equipment, time and, especially, purchasing of the equipment.

Using a statewide purchasing agreement, for example, Mecc is assisting schools with the purchase and maintenance of equipment, thereby effectively holding the line on costs.

Mecc seems to be an efficient and formidable method of providing instructional computing while overcoming prohibitively high costs and other problems.

It is also another solid demonstration of the growing use and acceptance of instructional computing.

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Larry Constantine—co-author of "Structured Design" in the IBM Systems Journal and co-author of Structured Design. Larry will speak on structured design and its impact on structured programming.

Bill Plauger—co-author with Brian Kernighan of The Elements of Programming Style, "Programming Style" "Examples and Counter-Examples" from the ACM Computing Surveys special issue on programming, and the soon to be published Software Tools. Bill will speak on programming style and will emphasize that eliminating GOTO statements does not ensure a readable program.

Tom Plum—co-author of "IF-THEN-ELSE Considered Harmful, "Teaching Structured Programming...by Example," and "Remedial Programming." Tom will serve primarily as moderator.

Ed Yourdon—author of Design of On-Line Computer Systems, Techniques of Program Structure and Design, and co-author of Structured Design. Ed will discuss the practical problems of implementing structured programming and the associated "programmer productivity techniques" in the typical EDP organization.

Ed Yourdon, Tom Plum, Larry Constantine, Bill Plauger and [illegible].

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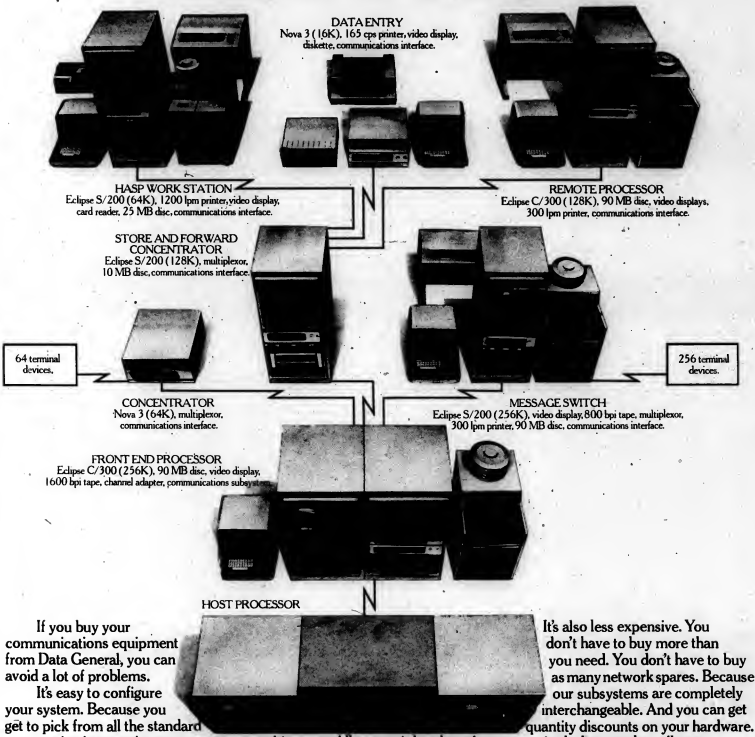
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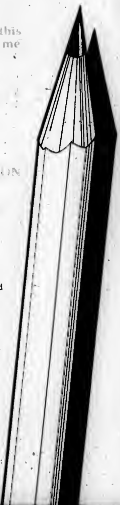

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Review and Forecast

SCDP Licensing Proposal Splits DP Community in 1975

By Catherine Arnst
Of the CW Staff

Licensing, certification and professionalism were issuea that polarized the DP community in 1975 after the Society of Certified Data Processors (SCDP) proposed DPers be licensed to practice.

One supporter of the measure thought it would bring computer personnel "recognition as professionals."

A detractor protested it would only result in "a license to steal."

SCDP sent a draft of legislation to all state legislatures in December 1974 that would declare data processing "a learned profession to be practiced and regulated as such."

The proposed legislation would have set up state boards of registration to rule on who could "practice data processing" and would have required DP centers to have a "registered professional data processor" on the staff with the "leverage" to grant or withhold approval of applications and systems.

The proposal brought cries of outrage from most segments of the DP community (in a *Computerworld* reader survey, 72% of the respondents voted against licensing and 15% supported it [CW, April 2]).

Legislation was introduced in three states and there was enough attention to motivate most major conferences this year to include a session on professionalism in their programs.

SCDP Not Displeased

Now, one year later, not one state has passed legislation instituting licensing, but the SCDP still considers its proposal a success, according to Kenniston W. Lord Jr., president of the organization.

"We have accomplished what we set out to accomplish," which was to draw attention to the need for a national set of standards directed toward the performance of DP people rather than systems, he said.

"Licensing was never the issue," he stressed. "Professionalism is the issue.

"Our concern is that the industry take some action on what affects people's health, welfare and well-being. We were not able to get any movement on our concerns before," Lord said.

A Quiet Death

Licensing itself appears to have died a quiet death after a noisy and what many considered a premature emergence onto the DP scene.

New Hampshire, Massachusetts and Florida were the only states to take action on the SCDP's proposal. The New Hampshire Legislature has referred the bill to committee until it meets again in January 1977 [CW, May 21]; Massachusetts killed the proposed bill in March [CW, April 9]; and Florida's bill, which only requires voluntary registration of Certificate in Data Processing (CDP) holders, is awaiting action by that state's Legislature when it reconvenes this month [CW, May 7].

A proposal for a voluntary state certification drafted by two members of the New York State chapter of the Data Processing Management Association is still being worked on, according to one of its developers, after an initial April meeting to discuss the proposal.

"Everybody is really on the fence on the issue," Fran Gawronski, a coauthor of the proposal, said. The proposal requires a great deal of thought and changes are being made continuously, he said, adding it will be discussed again at a meeting in March.

One accomplishment of the SCDP's licensing proposal, Lord said, is that it has "done a great deal to draw attention to the Certificate in Data Processing," which is awarded after successful completion of the CDP exam.

More Apply for CDP

His claim was backed up by the Institute for the Certification of Computer Professionals' (ICCP) announcement that requests for applications for the next CDP exam, which the ICCP administers, have reached 20,000, double last year's number.

And the ICCP has started a planning workshop to decide the structure of future exams, according to Martin Morris, who sits on the boards of both the ICCP and the Association of Computer Programmers and Analysts (Acpa).

The Acpa is one of the more vocal opponents of the SCDP's licensing proposal, although it does support voluntary certification. But "to gain credibility, ICCP has to come out with more than just the CDP exam," Morris said.

The institute is now working on revitalizing the Registered Business Program (RBP), which died because it was never promoted properly, he said. The RBP will test Cobol programmers' knowledge and should be offered by November 1976, he said.

Morris hopes the ICCP will begin to establish a series of exams for certain types of industries similar to those used by the insurance industry. Under this plan, the CDP holder would progress through a set of increasingly specialized exams concerning his field of work.

The Acpa, meanwhile, has moved for a uniform code of information processing similar to that developed by the British Computer Society, Morris said.

Development of this code "must come under the auspices of an umbrella group such as the ICCP, which has eight charter groups as members," because no one of the individual societies would be able to enforce a code on its own, he suggested.

Morris does not see these changes going into effect for five years and admitted "the move toward licensing may be progressing faster than this.

"I'm afraid some budding young legislator may sneak a licensing bill through," he said. "It depends on how much fraud there is in that particular state."

The Acpa is developing a legislative action subcommittee to pick up on any new legislation, but Morris suspects there won't be much action in the first half of 1976.

"The legislators say they don't want a damn thing to do with it" until an adequate testing and training base can be developed, he said.

No Push in '76

Lord agreed with many of his opponents that "it is too early for licensing" and does not intend to put the SCDP'a energies into pushing the licensing proposal in 1976.

His broader goal is to establish a uniform code of standards to protect the public from abuses, accidental or planned, by DP personnel that effect the health and well-being of the public.

"We must stop dealing with the sensational aspects of licensing and instead deal with the issues it raises," he insisted.

It doesn't have to take five years to develop a code of standards, according to Lord. "If I had five organizations and $100,000, we could have a code developed in a year," he said.

Din of Dissension Marks UPC Attempts As Whirr of POS Goes Unnoticed

By Toni Wiseman
Of the CW Staff

While the whirr of point-of-sale (POS) terminals in department stores goes unnoticed by most shoppers, the blip of Universal Product Code (UPC) scanners in supermarkets is being drowned out by the din of dissident consumers, legislators and labor unions.

The controversy, touched off by removal of individual item prices, centers mainly around the consumer's "right to know" and in the last year has been the basis of dozens of state, municipal and federal bills attempting to make price marking mandatory.

A strong force behind this legislation has been labor unions, which fear workers will be displaced by the scanners.

The battle between legislators/consumers and merchants/manufacturers has been a virtual draw so far – some bills passed, some rescinded and some defeated. Some remain in limbo.

To date, only four states have price-marking laws on their books: California, Connecticut, Massachusetts and Rhode Island.

The Massachusetts law is one of long standing and was not prompted by the appearance of UPC scanners. Connecticut and Rhode Island passed laws mainly because of labor efforts, according to a spokesman for the National Association of Food Chains. In fact, no store in either of these states is using scanning equipment, let alone removing prices, he said.

In California, where scanning equipment has been installed, a price-marking law will go into effect in April 1976 and run only until April of 1977.

In addition to state laws, a few cities considered laws. Chicago, for instance, passed a strong ordinance by a vote of 45-1. A similar measure was killed on the Illinois Senate floor for a lack of seven votes.

In all, 30 states introduced pricing legislation this year, but – with the exception of Connecticut, Rhode Island and California – the bills, including federal ones introduced by Sen. Frank Moss (D-Utah) and Rep. Harold Ford (D-Tenn.), remain in committe.

Three Conducting Teats

Some 40 stores throughout the U.S. have scanning equipment installed. Of these, only three conventional supermarkets – Lucky Stores in San Leandro, Calif., Marsh Supermarket in Troy, Ohio, and Giant Supermarket in Severnia Park, Md. – are actually conducting scanning tests without prices.

In addition, three warehouse distribution stores are testing with individual prices removed (warehouses do not normally price individual items).

On the basis of these figures – six out of 40 – it is hard to even suggest there is a trend away from traditional pricing.

NCR conducted a consumer study on scanning at its Marsh store installation. The study showed only 35% of the customers found their shopping pattern changed as a result of the removal of individual price marks.

Asked how they felt about eliminating item pricing if the store could demonstrate tangible price savings for the customer because of not having to mark the individual items, 27% said no pricing would be OK with any savings, 32% said it would be OK with some savings and 16% said it would be OK only with big savings, while 25% said they wanted individual item pricing under any circumstance.

The customers were split fairly evenly (54%-46%) when asked whether they wanted price marks to be put back on individual items at the end of the test or whether they could get along without them.

Comparison shopping has been one issue hotly debated. Consumers have said they cannot be sure the price they are charged at the checkout is the same as was on the shelf. Or, if there is a sale item stacked at the end of an aisle, they can't remember the other brands' prices.

Manufacturers have countered with the argument that comparison shopping will actually be easier with the new systems since, depending on individual store policies, the shelf labels will include unit-pricing information along with item prices.

Price comparisons either made at home or at other supermarkets, they contend, will also be feasible since the customer receipt includes a word description of each item. This enables the shopper to compare prices with earlier receipts..

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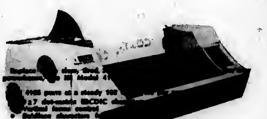

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Statistics Show Sex Bias Plagues DP

By Catherine Arnst
Of the CW Staff

Even though a majority of women in a recent survey [CW, July 23] reported encountering little discrimination in the DP field, a new statistical survey shows that in fact sex discrimination is pervasive and widespread.

Women in DP "are not receiving equal pay for equal work and may not be sharing equally in opportunities for advancement," according to a recent study published in *Communications of the ACM*.

Secret Service Files Prove 'Squeaky Clean'

By a CW Staff Writer

WASHINGTON, D.C. – Although the U.S. Secret Service maintains a computerized file on about 50,000 people considered potentially dangerous to the President, Lynette (Squeaky) Fromme wasn't in it.

Fromme, arrested two weeks ago for an alleged assassination attempt against President Ford, ... under Secret Service surveil... cording to a White House spo... Secret Service spokesmen, howe... fused to confirm this.

Fromme is a follower of ... Manson, who was convicted ... murder of actress Sharon Tate ... in August 1969.

Secret Service officials ... Congress, in open com... about the existen... ized file on ... dangerou...

IBM Trial Begins This Week

By E. Drake Lundell Jr.
Of the CW Staff

NEW YORK – After six years and 122 ... U.S. government's massive antitrust ... against IBM is slated to begin ... barring last minute ...

Licensing 'Oppressive': Glas

Army Surveillance Data Turns Up Two Years After Its 'Destruction'

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – Surveillance data on civilians and civilian organizations gathered by the U.S. Army prior to ... and ordered destroyed by ... of Defense (DOD) ... destroyed ...

specific permission.

The recent anno...

Brings Group to Full Strength

Ford Names Four to Privacy Commission

By Nancy French
Of the CW Staff

WASHINGTON, ... last week announc... appointments to t... Study Commission, create... Privacy Act of 1974. His announcement brought the commission to seven members, its full authorized strength.

The new members are William O. Bailey of West Hartford, Conn., executive vice-president of Aetna Life and Casualty Co.; David F. Linowes of Scarsdale, N.Y., a certified public accountant and partner in the New York firm of Laventhol, Krek... in, Horwath and Horwath; and ... Ware of Santa Monica, Cal... of the Rand Corp ... Research Staff.

and managing editor of the *Philadelphia Bulletin.*

Koch and Goldwater were appointed by ... of the House of Representatives ... and Tennes-...

president of the ...

Linowes, a Democrat ... scribed as "a business ... issues" and is ... *rate Cons... vival:* ...

rator of the Hartford Hospital.

Koch told *Computerworld* ... pleased the private sector ... ernments are represented o... sion.

"I intend, as I hope the oth... hearings regardin... with ...

Jr. and I have ... purpose of eliciting comments ... set in cement. Undoubtedly there mus... be additions, deletions and changes.

"That is why the privacy commission came into being – to provide a forum for ... testimony," he said.

Private Sector Awareness

spokesman for Goldwa... ...ssman is very ...

Business Booming at State Unemployment DP Centers

Xerox Departs Main

By E. Drake Lundell Jr.
Of the CW Staff

EL SEGUNDO, Calif. – "A sort of numbness" has settled ... people at what used to be the headquarters of ... 's Data Systems Division here.

... stand the idea that we're out of business on ... level," one said last week, "but psycho... in yet."

this is a period of rapid activity ... and inertia for the people here ... come before their pink sli...

Whining Terminals' Case Mystifies Ohio University

By Nancy French
Of the CW Staff

... Ohio – When Ohio State ... installed 16 new CRT ... December, library of... problems were ... literally ... solved.

And the Asciscopes seemed quite satisfactory in 10 other library locations, where background noise generated by conversation and other people traffic masked the whine.

"In the close confines of the telephone center, however, where the noise level was almost zero and where the terminal operators sat at the CRTs for long periods of time, the combination was deadly," Notestine said.

Cooperative Vendor

... with closing down the library's service center, replacing the ... employees with hard-of... getting rid of the two ... Notestine consulted ... and was told that ... the terminals ...

GAO Probing $403 Million SSI Errors

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – Problems with a computerized payment system designed to ... checks to recipients who qualify for the ... Supplemental Security Income (SSI) program ... been blamed for more than $403 mil... overpayments over the past 18 months.

This Social Security Administration program, which by June 30 had ... $8,075,277,809 in both state and fede... is now being scrutinized by the Ge... Accounting Office (GAO) at the reque... Birch M. Bayh (D-Ind.). Findings ... next month.

Bayh said he ...

DP for the Dogs

No 'Love Matches' Allowed for Canines

By Catherine Arnst
Of the CW Staff

MOUNT PROSPECT, Ill. – The perfect match is not made in heaven as far as selective dog owners are concerned; a computer service does the job for some canines here.

Date-a-Dog was started in May as a computer-assisted mating service for canines. The ... service is the brainstorm ... Don Spitz, owner of ... dogs, a pet and ...

listing 14 items about his dog including age, breed, defects ... attributes.

When a female is in ... two weeks out of ... computer ... of eligi... from ...

... system. It ... of its type in ... Spitz said, and the ... Date-a-Dog has been ... phenomenal."

The attraction of such a selective system is to "upbreed a dog; to breed out any genetic defects," Spitz said. A large number of show dogs are listed in the system, she said.

Technology, McDonald's Collide As Students Best Burger Bonanza

"There are a lot ... problems we hadn't ... when we decided to ... ize," she continued. ... were doing it ourselves, ... all the dogs. Now, people ... always fill out their cards ... estly. Everyone thinks ... perfect and ...

Commerce OKs Large IBM Shipment to

WASHINGTON, D.C. – The Commerce Department has given IBM "verbal" approval for the shipment of 10 System/7s, one 370/158 and related equipment and terminals to the Soviet Union – one of the largest Eastern Bloc computer ... ever to receive U.S. clearance.

The systems would be used at the ... River auto and truck manu... plant, now under construction ... and expected to be ... on completion ... for produc...

tems now goes to the Nato Coordinat... Committee, which must rule on all applications. Industry sources said, however, that in the past the com... generally has acted as a "rubber ... for applications which have cle... Commerce Department.

Terroris

CHICAGO – One ... among the nine ... corporate offices ... enced nearly simul... bomb explosions la... and Washington, D... As in all of th...

But Nature of Industry Cha

DP Sales Seen To

By Catherine Arnst
Of the CW Staff

HOT SPRINGS, Va. – With revenues ... billion this year, the ...

"The ... will con... classical ... ory, som... and out...

32,000 Converge on Anaheim NCC

By Ronald A. Frank
Of the CW Staff

– There was no recession ... than 32,000 converged ... Center for the ... a

and Control Data

IBM Plans Appeal

IBM Cleared of Telex Case Monopoly Charges

•Tactics Ruled Not Predatory

By E. Drake Lundell Jr.
Of the CW Staff

DENVER – The IBM actions in the pe-

... was ... pply

Judge Defined Market Wrong

By E. Drake Lundell Jr.
Of the CW Staff

– The key to th ... of Appeals' rev ... ment against I ... s in the area ... orny but critic ... e..

antitrust ... ries of tl ... the siz

claimed ... for p ... o

Lower Court Overturned

DENVER – In a wide-ranging ruling absolving IBM from monopoly charges, the Tenth Circuit C... Appeals here has ... the ...

man appeals court ... appa...

Catamore Wins $11.4 Million

Molly Upton
CW Staff

R.I. – After ... delibera- ... IBM

the counterclaim and we are going to appeal," Frank T. Cary, IBM chairman, said.

Judge Raymond J. Pettine commended the all-male jury for its work, noting this was one of ... longest jury cases he had ...

...'s lead attorney, ... Christo, said he ... a "major ... field ... nd

Co., known as Clements Auto ... $480,811.33 in damages. Cl... ments alleged SBC misrep... sented the capabilities of an ... ventory control reporting s... tem.

'Almost a Classic Case'

Christo called the Catam... case "almost a classic case ... first-time user right down t... very naive way that firs... users look at things."

In the case, IBM sued ... a jewelry manuf... payment and C... ed, charging b... breach of w... nd negligence ...

...amore's final clai... sought $26 millio... countersuit incl... ust charges, but ... separated.

Catamore, a firs... with no DP experi... sonnel familiar wit... that IBM offered a ... production control ... which Catamore ... pand its business.

Catamore signe... vices agreeme... reed orall... ineer...

Judge Orders DP-Aided Desegregation

...ith Holmes
CW Staff

Texas – A U.S. Dis... has ruled a computer ... help desegregate this city's ... schools with a minimum of bus-

... matter of school desegregation ... ds of the school district, Judge ... appointed a committee of ... cientists and three lay ad-... te plans that could be ... lly.

...ber, Dr. Joseph Rupp, ... miner and an officer ... called Concerned ... ested the court ... the ...lan.

has been working on million-dollar plans to desegregate its elementary schools for the last four years, the court-appointed committee has devised plans that should cost no more than $100,000 in five ... and with a minimum of busing.

"Children may have to walk a ... but the neighborhood school c... be destroyed as it would be ... busing," Rupp said.

All of the plans submitted ... have this characteristic, and ... decide on a particular soluti... implementation by the oper... the end of August, he added.

Rupp made his suggestio...

...rame Scene

...dicting it will be at least three ... number.

...had been no hint of the decision ... continue operations at all, with the ... information being that only four ... West Coast knew of the ... ncement up to a week

...ment found out ... managers held ... C. Peter ... opping

...le on ... nned ... efore it ... The ... abor ... wh... M

...ide ... with ... Xero...

...ing'

End Comes for Telex vs. IBM

TULSA, Okla. – Faced with the choice of rags or riches, Telex blinked and negotiated a settlement of its antitrust suit against IBM just 72 hours before the Supreme Court was to hand down its decision on whether it would hear the case.

The settlement called for no payments of any kind between the parties. IBM released Telex from an obligation to pay $18.5 million as the result of IBM's countersuit on trade-secret charges, and Telex agreed not to pursue its antitrust claims.

The negotiations leading to the settlement were initiated ... weeks before ... the ...

in the three days before the pact was initialed.

The suit was settled with prejudice, which bars Telex from ever bringing the charges again, ending one of the most dramatic private antitrust cases of the past 50 years.

The case resulted in IBM being handed its first antitrust defeat of the computer era, but IBM's persistent pursuit of its case won it a stun... reversal on appeal.

The move ...

Amdahl Ends Silent Years With Unveiling of 470V/6

By Patrick Ward
Of the CW Staff

SUNNYVALE, Calif. – Amdahl Corp. broke years of silence last week when it ...oduced a general-purpose computer it described as software- and hard-...compatible with the IBM 370/168, ...bout 100% faster.

...ddition, the firm announced two ... of lease financing for the system, ...ed the 470V/6.

...rmal unveiling of the 470V/... the first product announ... firm that Gene M... M Fellow and m... the Syste...

than the small-scale integration circuitry found on a 370/168.

The higher LSI packing density ... 100 circuit/chip vs. 5 circuit/... 168) cuts wire travel time ... principal reason why ... 32.5 nsec cycle ... 168's 80 ns... said.

Personalized DP Diets Wage Battle of the Bulge

By Catherine Arnst
...he CW Staff

... Atkins, Weight ...gging – these are ... more famous ... shed pounds by ... American adults ... than 20% over-

Computers have been used for some time in aiding menu and diet planning at hospitals, but a few commercial companies have taken the practice a step further by marketing computerized diets for the general public. The idea is to help the weight-conscious consumer slim down with his own personalized diet.

Two companies in this market are Nutritional Diet, Inc. of New York City and Time Pattern R... of New Jersey. B...

fed into ... med to ... cifical... need... Nu... tio... a...

...omputer program-... menu spe-... person's

The diet is both weight reducing and fully nutritional, he claimed, and he feels its attraction is that a dieter eats only foods he likes, and the meals are full enough so ... won't feel hungry.

...Make Money'

... with a ... a

through mail or direct mail, is available nationwide and costs $6.95.

Green said the diet has been successful and, although it may seem faddish, he personally would attest to its value. "I lost 50 pounds over 3-1/2 months, and a number of my friends lost almost as much."

The Cadence Computerized ... marketed by Time Pattern ... similar to Nutritional ... designed by Dr. ... tor of the ... at

...ussia

...n arrangements, pri... concern that there o... ve reaction from con-... such as the Young... in the U.S., some $12 billion was ... in this country on goods ... to wage

With Cash-Flow System DP Helps Juggle N.Y. Debts

By Don Leavitt
Of the CW Staff

NEW YORK – As late as mid-summer, this city's financially beleaguered administration ... unable to tell the ... sistance ...

years ahead, she said last w...

MAC is the New York-based sponsored organ... sponsible for floati... the city to help ...

The question was "pe... Letowt ... no ...

...s Claim Responsibility for IBM Bombing

...BM Plaza here was ... vernment buildings, ... banks that experi... neous early-morning ... week in New York ... as well as Chicago ... blasts.

viewed the bombings as part of a "coordinated attack against Yanki government and monopoly capitalist institutions."

By the middle of last week, Chicago police reported they had ...

gress in the case. Bomb experts believe the devices used here contained dynamite and were ignited by small propane g... s, a method used previously ... opolitan area by the FAI ...

... is able to ... for not j...

...ping $25 Billion in '75

...ng

...tecture of computer systems ... to move away from the ...mbination of processor, mem-... control circuitry and an input ... module. The computer will ... oriented around a vast

will be looking for alternate up... paths and manufacturers will offer ... IBM is already shifting its emp... away from rental, he added. The 51... for example, is a purchase-only machi... "It's becoming clear IBM's Gener... Systems Division represents a new voic... computer industry that we had ... said. "Perhaps

Equipment Stays Behind DPers Last to Leave 'Nam

By Edith Holmes
Of the CW Staff

...GON – Two computer spe-... as advisors to the ... government ... Americans ... be-

Employed by the California-based Computer Sciences Corp. (CSC), the two members of the CSC team of 12 in Saigon closed their advisory office to the Government of Vietnam (GVN) Computer Center when other nonevacuation-oriented U.S. operations terminated on Monday, ... 28.

...man for the company ... left" with the ... country the

...aid South Vietnam last December when the Southeast Asia Computer Associates (Seaca) in Honolulu lost its contract of several years in a bidding procedure.

...rall figure ... ds were ... es of ... ions

Equipment Intact

"At the time our contract, and thus our involvement, ended, all of the equipment was intact and the Vietnamese had assumed most of the operational and managerial functions," Norman Rezendes of Seaca said. Locate... in the prime minister's offi... GVN Computer Center ... an IBM 360/50 ... 24 hour/day

Another Year Proves 'Computers Don't Err—People Do'

By Catherine Arnat
Of the CW Staff

It's a cardinal rule at *Computerworld*: "Computers don't make errors – people do."

Nevertheless, it is often easier to blame some unreasonable foul-up emanating from the DP department on the unreasonable machine that processes all the data, rather than on the human who input it.

An executive at an Oregon bank summed up the situation when he blamed an error at his bank on a bug in the computer system. "That's only what we tell the public," he said.

"Isn't it funny how we'd rather blame the computer than human error? The customer accepts that a lot easier," he observed.

But passing the buck to a machine doesn't always work; the public realizes that someone is running those machines – and probably making some mistakes while he's at it.

Constant reporting of these mistakes, however, led one reader to complain that "the general public has now begun to regard DPers as a blundering group of professionals who make life miserable for everyone."

He suggested errors be reported "in a proper perspective" – as exceptions. "The public should be educated," he said, and that education must emphasize "that our techniques are good, our errors are small and, above all, that we are human."

But errors are not always small, and a mistake involving a critical piece of data can cause more damage than that done to the social life of the DP staff required to work overtime to correct it.

Spectacular Errors

The more spectacular errors of 1975 concerned welfare payments, which generally involve that segment of the population least able to afford any foul-ups.

In New York, improperly coded Medicare claim forms caused as much as $12.7 million in medical bills to go unreimbursed last year, a study by the General Accounting Office (GAO) reported [CW, Aug. 20].

According to the report, 65% of the patients sampled who had filed claims for surgical procedures were paid less than they had expected, and as many as 13 of the claims processed contained coding and data entry errors. The GAO attributed the underpayments to coding errors, lump coding and inaccurately skewed fee schedules.

Although data entry personnel who enter the information into the Medicare system can catch the most obvious errors through a built-in edit program, many go undetected at this stage of claims processing because of simple keystroke errors, a spokesman for the Social Security Administration's (SSA) Bureau of Health Insurance added.

In August, a programming error in Maryland resulted in $10 million in overpayments to about 15,000 people all over the country covered by Supplemental Security Income (SSI) [CW, Sept. 3]. This brought overpayment under the new federal welfare program to over $403 million in its first 18 months of operation and caused President Ford to ask the Office of Management and Budget to review the matter.

The Washington Star reported that when Congress was considering SSI, congressmen were assured the SSA's computer operation, its years of DP experience and its reputation for being among the most efficiently run federal agencies would make the system work from the word "go."

But it seems that someone told the agency not to pass "go" and not to collect $200, much less $403 million.

In Washington and Florida, the state Social Security Departments went the opposite direction: rather than take the chance of overpaying, two living recipients were declared dead and payments were stopped altogether [CW, June 25]. Both women have since been resurrected.

Review and Forecast

Unemployment centers faced with soaring unemployment rates were also the source of DP errors this year. Both Arizona and Colorado experienced problems with overburdened systems and inexperienced employees hired to handle the rapid rise in claims [CW, May 7]. Approximately 12,000 people were kept waiting for their checks in Arizona and 200 were held up in Colorado.

And, of course, there were the billing errors, those Kafkaesque nightmares that everyone or his neighbor seems to get embroiled in at some point. Tales of unending correspondence with unfeeling computers have filled the pages of *Readers Digest* for years.

One example occurred in Tennessee when two seperate lawsuits for $100,000 were filed against the J.C. Penney Co. because of billing errors [CW, April 9].

Robert C. Moorhead charged the store with "outrageous conduct" for its repeated billing of $16.78 when the amount should have been a credit. After a year and four months of trying to correct the error (during which time even the store admitted the error, opened a new account for him and carried over the old charge, Moorhead decided to sue.

William Smith was billed by the store for charges made on someone else's account, in spite of the fact that the account numbers were different. It only took him a month to file suit.

Consumers are protected from this kind of harrassment by the Fair Credit Billing Act, which went into effect Oct. 28. Now, a creditor must acknowledge a written inquiry from a customer concerning computer-generated overdue notices within 30 days and resolve the dispute within 90 days.

Help for Taxpayers

Taxpayers may have the same kind of protection from the Internal Revenue Service (IRS) in the future, mainly because the person that agency chose to dun for 18 cents interest on an amount he already paid – twice – was Rep. Clarence Long (D-Md.), who sits on the House committee which appropriates funds for the operations [CW, Nov. 12].

Long is drafting a bill, the Taxpayer's Bill of Rights, to prevent taxpayers from being plagued by the IRS any more than they already are.

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Surveys' Conclusions Differ

Sexism in DP Industry a Controversial Issue in '75

By Catherine Arnst
Of the CW Staff

"I hope in 10 years from now I'm not even asked about women in computing," Jean Sammet, president of the Association for Computing Machinery (ACM), said in November of 1974.

In 10 years her wish may come true, but in 1975 the attitudes of and about women working in DP became one of the more controversial issues in *Computerworld's* pages.

During a four-month period, five articles, three editorials, one reader commentary and 29 letters to the editor were written on the subject.

All attempted to either prove or dispel the idea that sexism exists in the industry.

Opinions ranged from a description of "the overall picture of the industry as a disgrace" by Judith Lightfoot, an officer of the National Organization for Women, to the cynical letter claiming: "There is a much simpler solution to the problem of the underpaid female in DP: less brain, less pay."

Different Versions of Truth

Three different surveys came up with their own versions of the "truth." CW's sampling of 30 women chosen from Computer Caravan attendees revealed 18 of that group did not feel they had been subjected to sexual discrimination.

However, six added, this was primarily because their individual companies were good in this respect, and others said they may yet encounter problems when they try to advance into management.

There was a definite split between women with a number of years of work experience and those who only recently entered DP.

Eighteen of the 30 had been in the industry over four years; nine of these claimed they had met discrimination. Of the 12 who had worked less than four years, only three felt they had encountered discrimination.

Review and Forecast

In *Datamation*'s August issue, a survey of 327 women came up with similar results: two-thirds of the respondents felt they had equal status with their colleagues in pay, promotions and overall.

Seventy percent felt they had opportunities for advancement to a senior level, but only slightly over half thought there were opportunities for women to hold highly responsible management positions.

And, once again, "the 'yes' answer to management opportunities came preponderantly from the youngest age group," the authors said.

These two surveys measured attitudes; a study of the facts came up with opposite conclusions.

An article in the July issue of *Communications of the ACM* said "women in DP are not receiving equal pay for equal work and may not be sharing equally in the opportunities for advancement."

Using statistics culled from the U.S. Census Bureau, the Department of Labor's Standard Industrial Classification employment data and the Bureau of Labor Statistics' Area Wage Survey, the authors found women constitute only 20% of the overall work force in the computer users area in contrast to 39% of the national labor force; women tend to be employed in jobs with lower requirements; and within each occupation, women are paid, on the average, less than men.

Why the Difference?

Why the difference between women's version of the situation and reality? Lightfoot suggested women have bought the industry's promotion of the myth that DP has avoided the discrimination traditionally found in other industries because it is relatively new.

"Women aren't active in fighting discrimination because this is an industry where women themselves believe the propaganda," she said.

Whether or not the issue will be a dead one 10 years from now is dependent both on women becoming more visible and on their employers putting greater effort into noticing them, according to members of a panel discussion on promoting women held this fall.

If that doesn't work, women might find some small comfort in CW columnist Herb Grosch's rule of thumb that "in the end, everybody, even scientists" have to die and as "the old men sitting on the promotion committees and in the managements above [women] . . . die off . . . the level of management that women in DP are allowed to enter increases."

List of Recalled Cars Aids Potential Buyers

WASHINGTON, D.C. – The National Highway and Traffic Safety Administration (NHTSA) of the Transportation Department has built a computerized list of motor vehicle recall campaigns by individual vehicle identification number (VIN) and by recall campaign.

The system enables someone who is considering purchasing a used car to find out whether the vehicle contains any uncorrected defects.

Manufacturers are required to submit quarterly reports by VIN to enable owners to find out whether their vehicles are or ever have been subject to a recall campaign.

There is no charge for a search on one vehicle, and the agency promises answers within 24 hours after receipt of the request.

To check the recall status for a specific auto, a requestor can send his name, address, manufacturer's name and the VIN number of the vehicle to NHTSA's Office of Consumer Services here in Washington, D.C., 20590.

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With Ervin's Retirement

Crime Data Protection Legislation at Low Ebb in '75

By Nancy French
Of the CW Staff

Congressional activity aimed at protecting the privacy of criminal justice information seems to have languished this year with the retirement of former Sen. Sam Ervin, privacy's leading proponent.

Sen. John Tunney (D-Calif.), his replacement as chairman of the Senate Constitutional Rights Subcommittee, earned himself bad marks in the *Los Angeles Times* for supporting criminal justice information bills that journalists there viewed as sabotaging "freedom of the press" in reporting on crime.

Tunney, who is up for reelection in November, suffered for his efforts, yet his staff members toil on in search of a compromise bill that satisfies the constitutional rights of criminal offenders without hamstringing legitimate law enforcement activity.

In the House of Representatives, where responsibility for drafting a criminal justice information bill lies in Rep. Don Edwards' (D-Calif.) Subcommittee on Civil and Constitutional Rights, bills have been drafted and redrafted.

However, criminal justice information problems were placed on the back burner when the subcommittee was assigned the job of writing a municipal bankruptcy law when it appeared New York City ght go under.

In recent wee' 'hat committee has been further bogged down over the issue of the Federal Bureau of Investigation's reported mishandling of investigative information that might have led to Lee Harvey Oswald's detention before President John F. Kennedy's assassination in Dallas in 1963.

Review and Forecast

The hearings brought bright lights and cameras, but no new answers.

After reassessing time estimates, both Senate and House subcommittee staff members predicted bills will not be ready for consideration by their respective Houses until sometime during the first quarter.

While legislative action seemed to diminish in 1975, activity in the executive branch – especially in the Justice Department – was stepped up sharply, first in May, with the issuance of formal rules and regulations for handling criminal justice data.

The new standards were imposed on every law enforcement agency that had ever received funds from the Law Enforcement Assistance Administration (LEAA) or interfaced with the National Crime Information Center (NCIC).

Although the regulations merely formalized existing practices in most cases, they did provide for individual access to one's own arrest record and for updating and completing as well as limiting dissemination of arrest information without dispositions.

The rule mandating dedicated computers for crime data brought a storm of protest on cost grounds from state governors, attorneys general and DP professionals who accused federal officials of substituting hardware for proper management.

Five months later, the Justice Department backed off and revised its rules to specify only that systems be secure, leaving the dedication vs. shared system decision up to the individual states.

Opposition Thaws

Observers said the Justice Department's attitude against legislative control, frozen into absolute opposition during J. Edgar Hoover's reign as FBI director, is thawing.

As evidence they cited Attorney General Edward Levi's October decision to defer further development of an FBI-controlled message-switching system until Congress has time to propose legislation – a move considered by some to be a landmark decision.

Spokesmen on Capitol Hill said the most recent versions of the criminal justice information bills would not permit an FBI-controlled message-switching system.

Observers also noted the Justice Department's apparent recognition of the importance of the states in the law enforcement process and the dangers posed by an over-powerful federal police force.

Justice Department officials have become increasingly cooperative in helping iron out problems encountered in writing a good crime information bill, one Congressional aide said.

The year 1975 saw the number of states entering data into the FBI's Computerized Criminal History System increase from four to seven, and LEAA's annual obligation of funds to state and local projects rise to more than $861 million from $821 million spent the year before.

The year also saw an innocent Florida man slain by a state trooper whose use of force was ruled justifiable because erroneous information had been given him over his two-way radio – information that was based on a misinterpreted record from the state's computerized criminal information system.

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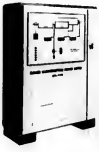

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Start of U.S. vs. IBM Antitrust Trial Just the Beginning

By Edith Holmes
Of the CW Staff

Review and Forecast

NEW YORK – In antitrust circles within the computer industry, 1975 will be known as the year U.S. vs. IBM went to trial.

The magnitude of that feat can't be conveyed even by recalling the government's case against IBM had been in preparation for six years and 122 days when it opened in the U.S. District Court for the Southern District of New York here on May 19.

It is the most massive antitrust case yet to come to trial, a trial which will probably be one of the longest on record.

But beyond the fact that U.S. vs. IBM has started, the government has made little progress in marshalling the evidence and processing the witnesses it hopes will show IBM monopolized and intended to monopolize the general-purpose computer systems market.

Assuming the current estimate that the Department of Justice will complete its direct case by this time next year, IBM won't even begin to present its defense until early 1977.

The government has charged IBM with a violation of Section 2 of the Sherman Antitrust Act – the central law dealing with the definition of monopoly and the remedies available to those seeking relief from a monopolized industry. If it is to prove its case, the government must show IBM did have a monopoly in the systems and peripherals markets.

In addition, the attorneys with the Department of Justice plan to prove IBM's "intent" to monopolize these markets by detailing marketing practices, not in and of themselves illegal, which the corporation has used.

These practices include "bundling" into one price the separate costs of each part of a computer system, the use of "paper" or "fighting" machines to stave off competition in the field and a discriminatory employment of educational allowances or discounts.

In addition to showing IBM used these tactics to the detriment of other manufacturers in the systems business, the government also intends to prove IBM's conduct in the peripherals market – essentially the case brought by Telex Corp. against IBM and settled earlier this year – provides a further example of the corporation's efforts to maintain its dominant position.

For similar reasons, the government plans to bring IBM's conduct toward leasing companies to the court's attention.

Indication of Success

For its part, IBM counsel has indicated it will prove the corporation hasn't done anything illegal; IBM may dominate the marketplace, but its position is only the result of its success.

That success, the defanse will argue, is based on the fact the corporation's management risked the entire organization on the development of the computer industry. Right decisions at the right times in seizing product, marketing and financial opportunities justified that risk.

As the government has presented the market definition portion of its case over the last few months, attorneys for IBM have repeatedly called into question the validity of a "systems" and other markets the government would define during its cross-examinations of government witnesses.

When the time comes for IBM to present its defense, the corporation will try to show there are currently over 100 firms competing in the computer business with new entrants every day – hardly the marketplace of a monopolized industry.

But IBM's direct case is a long way off. The government has completed the testimony of 17 witnesses in 18 weeks of trial resulting in nearly 10,000 pages of transcript. While there have been many recent deletions from the list of those to be called to the stand, some 90 people are still scheduled to appear in court on behalf of the government.

The government has been particularly concerned with establishing the existence of the systems market, the names of the major competitors, their shares of the total computer business pie, the dominance of IBM in the field and the existence and use of the marketing practices mentioned above.

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Editorial

A Needless Killing

A Florida man was slain needlessly early this month because a skittish state trooper thought the car he was approaching was stolen.

Given that fact, the trooper felt the driver could be dangerous. When he approached the car, the driver's peculiar, jerky motions and failure to follow instructions led the trooper to believe the driver was reaching for a gun.

Trooper Robert Rennie Jr. shot the man in what he believed was self-defense [CW, Dec. 10].

Frank Booth, the driver, is dead – not because of police brutality or police overreaction, but because of sloppy recordkeeping in a poorly conceived or maintained criminal justice information system.

The trooper, who saw Booth parked alongside the highway, no doubt stopped to see if the driver was in trouble – to see if he could be of assistance.

Rennie called in the vehicle's license number as a routine self-defense measure and, much to his apparent surprise, was informed via his two-way radio the license number he had just fed in was a "hit."

The number would have been a hit had the year been 1971. It was not a hit in 1975. Rennie didn't know, however, that the record he had brought up was entered in 1971. And he didn't know that same license tag number had probably been issued to three different individuals since the original auto bearing that tag was stolen.

Until 1974, Florida assigned new license plates with the same numbers to different individuals year after year, without checking whether the number was listed in a wanted or stolen vehicle file in the state's criminal justice information system.

The trooper involved was suspended immediately pending the findings of a coroner's inquest.

After reviewing the evidence, the coroner's jury found Rennie's use of force "justified" under the circumstances, and the trooper was cleared [CW, Dec. 17].

But the matter should not stop there.

There is no need to heap extra pressures on the policeman on his beat or a trooper on the highway by providing criminal justice information he cannot trust.

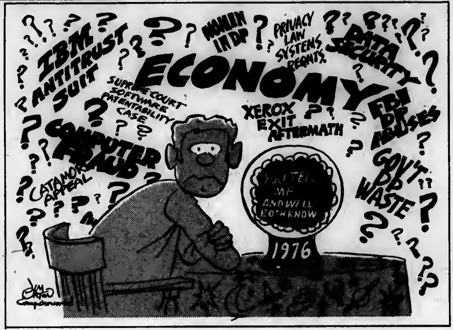
Almost in spite of Florida's motor vehicle licensing practices, that state's criminal justice information system, which depends heavily on such data, allows old records and new records to be mixed indiscriminately in its stolen property and wanted persons files.

There is no excuse for this. While software is available to place old records under a different security category in a complex, on-line criminal justice information system, this seems an unnecessary expense for outdated records.

Such files should be deleted from the system and stored off-line, where they could be accessed if needed to identify a vehicle found at the bottom of a lake, for example, while avoiding the possibility of such an unnecessary killing or even arrest occurring again.

The state's motor vehicle licensing policy was changed in 1974 and drivers now retain the same number indefinitely. Interestingly enough, this was not done because the system was poor, but because of the high cost of issuing new license plates every year.

The problem of misinterpretation, however, will not be eradicated until the criminal justice files are entirely purged of outdated records. This work should start immediately.



Letters to the Editor

Data Entry Suggestions Recall 'Age of Managerial Ignorance'

E.M. Hughes told us more about himself and his company than he told us about "average" keypunchers ["Psychology Reduces Data Entry Inefficiency," CW, Dec. 17].

His attitude is such that he should never qualify for a management position. I believe he is a frustrated programmer working in a big shop with a gigantic ego to match the chip on his shoulder.

In terms of professionalism, where are the sources to support his claims? Where did he get his data?

Hughes is telling us that his company destroys the initiative of its operators, engages in petty practices and is the victim of the resentment that is created within the data entry group.

Hughes thinks it is not necessary to relieve the boredom of his shop by conversation, smoking, coffee breaks or rest periods. He thinks he knows more about the job than the people who work at it every day. Rather than learning from what they could tell him, he ignores and abuses them.

Hughes is not a modern manager but a throwback to an age of managerial ignorance. He would be much happier if he could walk into his shop in the morning, turn on the robots and punch the buttons.

Unfortunately for him, the robots still need human brains to work, and those brains are to be found in human beings. Hughes needs some lessons in respect and tact.

Frederic McNally

N. Syracuse, N.Y.

Elizabeth M. Hughes' reader commentary was based on her experiences working as a keypunch/keytape operator for a year and a half. Part of that time was spent at a small service bureau, the remainder at a large in-house facility. Ed.

Experiences Make Good Reading

After reading the responses of Ken Yoder and Donald Collins [CW, Dec. 17] to my letter of Dec. 3, I was surprised it deserved such zealous replies.

Yoder has convinced me he is convinced NCR is now a responsive company. Things have obviously changed since my involvement with the early Century series.

Collins referred to my letter as a "classic example of hasty and poor judgment." It may have been "poor," but it was not "hasty."

I am not a theoretician on NCR – I have dealt with them. Don Masterson's presentations on Midlands' "On-Line Management Information Systems" might be good, but his papers have little or no relationship to the virtues of NCR.

Some installations are successful in spite of their vendor or hardware but, more importantly, user expectations of vendors and hardware vary from company to company and person to person, thereby giving birth to a variety of experiences and opinions which makes good reading in *Computerworld*.

David L. McMonigle

Caledonia, Mich.

Credit Bureaus Misrepresented

Humor is fine, but it was somewhat discouraging to see the misimpressions about credit bureaus that were conveyed in the editorial page cartoon appearing in the Dec. 10 issue of *Computerworld*.

Contrary to the cartoon's implication that any credit bureau might have the denial of accounts as its primary purpose, credit bureau reports facilitate the establishment of new accounts in some 90% of the occasions of their use.

The suggestion that investigations enabling credit grantors to make sound credit decisions constitute invasion of privacy place CW's cartoonist in a distinct minority of opinion.

According to a recent Opinion Research Corp. poll, 95% of its respondents agreed credit grantors have a right to information concerning an individual's ability to pay his bills. It is precisely this information that credit bureaus provide.

J.V. White
President

The Credit Bureau, Inc.
Atlanta, Ga.

A Let to Lose

Herb Grosch, in his Dec. 17 column, said "we have everything to gain and nothing to lose" by selling sophisticated computers to Communist countries.

We have quite a bit to lose – our national security, for instance.

Just what does Grosch think the IBM 370/168s will be used for – playing simulated football games? Is it beyond his conception they might be used to develop weapons systems which could be used against the free world?

Why, on God's green earth, should bourgeois capitalists help Bolsheviks better run their police state?

In an era when Western military superiority has become not so superior, I find at least one bright spot in the fact that there is a "five- or six-year gap in computer technology between [the Communist countries'] efforts and those of Western societies."

Viva la gap. May it grow ever wider.

Richard L. Grossman

Chicago, Ill.

(Other letters on Page 18).

Computerworld welcomes comments from its readers. Preference will be given to letters of 150 words or less. Letters should be addressed to: Editor, Computerworld, 797 Washington St., Newton, Mass. 02160.

Wring Out the Old!

And so we bid an unreluctant farewell to the last full year of the Fourth Generation – a generation that began with a whimper in 1970 and will end with a bang late next spring. Out in the real world, it was a year of doubt and dismay, as years usually are since the United States lost heart in the Sixties. But it was a year tempered by hope, as the economy turned upward and a merciful if rather tardy Providence removed two lamentable incrustations, Francisco Franco and J. Edgar Horror.

Closer to home, it was a year marked by the unveiling of Gene Amdahl's small giant, the withdrawal of Xerox and Philips, and Honeywell peddling Bull back to the Gascons. It was the first year for 16K chips and the first of many "last" years for cores (it must be nearly two decades since I first heard, "This is the *last* year for the 80-column card"!)

Fantastic progress in microprocessors; a new set of enthusiasms and slogans – but, as usual, no actual improvement – in software. Genuine but not particularly fruitful concern for the social interactions of our trade; comissions appointed, reports rendered, standards adopted – mostly tongue-in-cheek. Ten paces forward, nine paces back.

Perhaps more than any other, it was the year when IBM's legal prowess became obvious. In courtrooms and in judges' chambers, and in plush law offices where compromise and the civilian equivalent of plea bargaining takes place, the flimsy ghosts of antitrust and user rights were exorcised.

It was a year for rationalization and consolidation. Good service firms, good software packages, good data networks prospered. There were flurries of excitement about facilities management and the first skirmishes on the commercial packet-switching front. The really big systems flourished, or at least the vast majority; there were rumors that Livermore, that conduit through which the huge CDC machines passed on their way to secrecy and oblivion, was in flux. And the lock-the-door-at-five-and-go-home minisystems sold better than food stamps.

Seminars, road shows, exhibits did well. IBM reserved an extra-large prime space for next year's NCC gala. The usual dull technical papers and vacuous panels proliferated *a la* Parkinson at myriad meetings, and the academics huddled over their paltry politics. The struggles inside ACM between the Establishment and its opponents sharpened. The financial and organizational problems in DPMA leveled off. And Ken Lord remained mischievous.

Japan continued to be the rapid-growth region of computer use, worldwide. The British and the Italians, snarled in unworkable economics, drew much sympathy (and precious little else) from the computer community. The big news for the French and the Germans was the struggle for Unidata, which like a football is of low intrinsic value, inflated to the limit and kicked around by everyone – but the focus of all eyes nonetheless. East Germany sold a big (for it) computer to Control Data, which hopes to reciprocate in spades: say, a billion dollars worth of jazzy disks and tapes and printers. At the end of the Forties, abstemious IBM took its Spanish and Portuguese profits in sherry and port; CDC, if it barters with the East, may end up with vodka and 5-put Tokay. Suggestion: mix 'em over crushed ice and call it a Norris Wallbanger!

The big sleeper of the year was not Amdahl/Fujitsu, which had been on the front burner for some time, but the awakening of the business community to the costly realities of personal data privacy and security. Ignored for several years, and in many contexts actually advocated or at least given lip service, privacy and concern for human rights now turns out to require (what else!) lots more core, lots more disk, a dozen new kinds of logs and records, oodles of unwritable software, and bushels and bushels of bucks. And the stable door is open: the public, which could easily have been steered away by adroit PR tactics, is alert to the problem. Privacy sells! Sells papers and magazines and talk-show attention. The credit bureau ogres and the bureaucrats are just beginning to realize that benign neglect was *not* the correct entrepreneurial stance. Hah!

For me personally, 1975 was a year not of waiting for neo-FS and a thousand on the Dow, but of vigorous change. I changed my relationship with *Computerworld*; I moved to California; I married again. I lost an old and dear friend, Stan Gill. I made new friends, and new enemies. I flew a hundred thousand jet miles, and drove three thousand with an old pet: over Tioga with Cat Chow and litter box! It was a good year for me, a vigorous year, a year of new beginnings. Next year I expect to stay fairly firmly rooted, while the computer world writhes and groans and comes apart at the seams. Come on; 1976, you berserker; bite your shield, howl like a wolf – I'm ready!

Herb Grosch

Information Sought on Check-Digit Monitoring Efforts

The Taylor Report
By
Alan Taylor, CDP

A couple of months ago a discussion of check-digit methods in this column turned up a totally new method being used in Florida by Digitex Corp. [CW, Oct. 22].

Called the Deeds method after its developer, Dr. Joseph Deeds, the system was based upon defining a special multiplication table which had none of the ambiguity problems of the standard multiplication table. Thus the Deeds method was able to avoid some of the problems that occur in check-digit methods using weighting multiplications of various types.

At the same time, Deeds introduced the idea of keeping "0" as an identity, which keeps a check digit once computed for, say, a six-digit number also correct for the same number in a seven- or eight-digit or longer system. This was a major breakthrough, but is not the one we are concerned with now.

During the discussion it was suggested that one way of using the Deeds method is to note the cases which it is known not to detect completely and eliminate them.

There are objections to this approach, not the least being the fact that I at least didn't know how to find the potential error pairs – i.e., the sets of two numbers which would permit some changes and yet be able to pass through the checkout routines.

Minimization Rejected

The matter of detecting these errors then took on a new urgency when Magdi Riskalla pointed out this approach – using statistical methods to identify and eliminate problem areas, rather than simply minimize them as has been the practice to date – could perhaps lead to another breakthrough. But first a method of locating those errors had to be found.

Traditionally, check-digit error analysis estimation has concentrated almost entirely upon two types of error:

- Single-digit transcription errors.
- Two-digit transposition errors.

The single-digit transcription error occurs when a single character in the checked number is incorrectly reported for any reason. For instance, 12346 would be a single-digit transcription error for a correct number 12345. So would 22345 or 13345.

The two-digit transposition errors are equally easy to describe, but a lot harder to identify as really being ambiguous within a specific checking method. The error consists of simply changing the values of two of the digits in the correct number. The number 12345 gives rise to possible transpositions of 21345, 32145, 42315, 52341 or 13245, for example.

Normally, in examining a check-digit method, these are broken down depending upon the number of digits that come between the two transposed digits. The number 32145 is a transposition over a single intervening digit, while 52341 is one over three intervening digits.

The various methods give different percentages of success faced with these transpositions – but so far do not lend themselves to identifying in advance which numbers are subject to higher error rates.

Case Identification

It now looks as though this can be done for both single-digit transcription and two-digit transposition errors. Raw numbers, if sorted by four fields (check-digit, sum-of-digits, the greater of each potential transposed pair and a transformed number with both digits eliminated or set equal) will have duplicate equal sorting positions whenever any error can slip through a particular system. This identifies each possible error case for further study.

All well and good – and this is now proceeding. However, it really isn't enough, because it is based upon potentially outdated thinking on what errors are being checked for. Potentially outdated – but perhaps still accurate thinking. We just don't know. So that is where the problem lies today.

And that is where your help is asked to find out whether the traditional error thinking is still valid.

The single-digit transcription and two-digit transposition errors are both humanly-based "thinking" errors from punched card days.

Factually, we need to know more about what errors are actually occurring and under what circumstances. In particular we want to know what other errors beyond the two traditional cases are occurring and how frequently, at least by comparison.

Do you know, by any chance? Is someone around that is keeping some sort of monitoring operation going that can give some clues to the actual situation?

If so, please write and let us know.

A questionnaire is enclosed to help you. In the meantime, work on check digits is going on and further news will be given in the column as it progresses.

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ERROR-MONITORING QUESTIONNAIRE

Item being monitored (account number, X-ray identification, etc.): ____________________

Field length: ____________________

____

Protection method(s) used: ____________________

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Monitoring methods: ____________________

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Monitoring results (if known): ____________________

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Letters to the Editor

Programmers Should Learn To Use Available Tools

Many of the recent letters concerning debugging Cobol programs from core dumps were totally ridiculous. Programmers who debug from core dumps have been called, in effect, garbage men.

D.S. Owings [CW, Dec. 17] apparently has a group of magicians which has never needed the Abend address, data being acted upon or even the determination of cause (data, hardware, software, etc.) to debug Abends.

In the real world, all of the advocated tools (core dumps, programmers' guides, sophisticated software and individual experience) are needed and commonly used in Abend solution. Unfortunately, all of the above tools are usually in equally short supply.

Roger Poole [CW, Nov. 12] had the right idea. If debugging from a core dump is necessary (I believe there will always be some occasions), then certainly a "Debugging From Core Only" guide will be welcomed by a majority of the programming community.

In short, programmers should spend less time carping and more time discovering how to effectively use the available tools. If a better way is available, find it and/or develop it.

After all, that's what we get paid for!

William L. Maltby
Information Systems
Western Electric Co., Inc.

Packages a Possibility

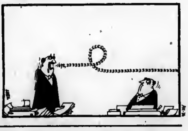
A recent letter from Roger Poole [CW, Nov. 12] requested literature on debugging from core only.

I was a Cobol programmer for several years before I left my position to return to college. My former employer had purchased a software package that improved the core dump.

The package located and identified key areas in core dumps and printed them in readable form. This greatly reduced my program debugging time.

I suggest that Poole investigate programs of this type to see if they would be useful to him.

Mary Bolton
Orange, Calif.



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N.Y. Bank Backs Career Pathing With 'Draft System'

Peopleware

By Don Leavitt
Of the CW Staff

NEW YORK – Many installations are beginning to realize successful DP depends on the ability to attract, motivate, guide and satisfy the people who work with the hardware and software. But few have done anything much with that realization.

Manufacturers Hanover Trust Co. is an exception. It recognized tha problem, brought in a consulting group to gain insight into what should be done and then established its own internal organization to provide ongoing people-sensitive management within the DP function.

The New York-based Berton Group helped in several ways, according to Charles D. LaBell, "Manny Hanny's" vice-president of DP human resources.

The consultants supported the bank in its efforts to identify what tasks actually had to be done by personnel within the DP organization, which positions should have responsibility for each task and what skills were needed by people in order to fill those positions.

More than that, the Berton Group also helped identify the skills requirad to move from one position to another and the educational tools that could provide those skills.

Once that base was developed, the bank modified its own structure to take advantage of the new interest in people. LaBelle's human resources function was set up on a par with DP production and system development.

With responsibility for securing, organization and control as well as evaluation and review of people, LaBelle reports to the same vice-president as the other two managers.

Within his operation, LaBelle has two subfunctions: human resources acquisition and human resources development. Clearly these are related, he admitted, but they do have some very different responsibilities as well.

The bank is strongly committed to internal mobility as a means of filling vacancies, and half the acquisition function is geared to supporting just such a mobility, he went on. One of the most unique functions the acquisition subfunction supports is a "draft system" which operates "like Pete Rozelle's NFL draft," according to LaBelle.

Managers in need of people meet and review the skills profiles of bank employees. The managers with the most critical needs get first crack at anyone they feel is qualified, even if acceptance of an offer would lead to a transfer across department lines.

Unlike a military draft – and perhaps unlike Rozelle's as well – the "Manny Hanny" draft call can be refused by the selected candidate. And a refusal will have no negative impact on later reviews of the candidate's skills or performance or any salary increases to which he might be entitled, LaBelle emphasized.

The other side of the human resources acquisition operation deals with hiring new employees from outside and the management of consultants when a temporary need for special skills is recognized.

The development half of LaBelle's operation is also split in two, differentiating between career development itself and the education required to foster that development or to satisfy the needs sensed by DP staffers, even if their desires are not immediately related to their career path.

Performance analysis and career counseling are the main activities on the "developmant" side of this subfunction. The performance analysis includes periodic self-evaluations of each worker's effort as well as evaluation by his manager.

But this part of the human resources staff also supports an ombudsman who is available to mediate in case of problems that can't be resolved by more conventional means.

Does LaBelle's approach work? It apparently works for the DP operation, he said, and now the comptroller's division is studying the possibility of applying the same kind of approach to its operations.

'Cogent' Simplifies Language Building

ORINDA, Calif. – Users faced with the prospect of generating compilers can work with a metalanguage that describes both the syntax and the semantics of a language as part of the Cogent system, according to the vendor, Virtual Memory Systems (VMS).

By supporting both syntax and semantics, Cogent is said to cut compiler development time to "only six to eight weeks of programming time."

The system is "highly machine-independent," a spokesman said, adding that it has been implemented on "several" minicomputers and in IBM 360/370 environments.

Cogent is "well-suited" for the development of compilers for industry-standard languages such as Algol, Cobol or Fortran. It can also be used to build special-purpose compilers for system programming languages, information update and retrieval, logic testing and other special applications, he added.

Designed for Flexibility

Cogent was designed as a flexible system and can be tailored to meet unique language requirements by means of user-supplied parameters. Compilers produced by Cogent consist of Assembly language statements or source language statements to be translated by an existing compiler, VMS said.

As a result of its organization, Cogent is useful as a means of converting programs written in one language to run in another language environment, the spokesman added.

Compilers produced by Cogent may operate interactively, he said, and actual application programs may execute interpretively if desired. Since Cogent itself is modular, extensions to its capabilities can be added as the user defines them.

Cogent was designed to operate on a wide range of equipment. Primary requirements, however, include a sequential input device, a sequential output device, a listing mechanism and, the vendor noted without comment, a processor.

Minicomputer core requirements typically are 24K bytes, while IBM users generally need less than 256K bytes.

Sold as a licensed product including implementation on a specific CPU, training, maintenance and a one-year warranty, Cogent costs $32,000. VMS is at Suite 3, One N. Hollywood Drive, 94563.

NCR 770s On-Line to Centers

DAYTON, Ohio – Financial institutions will be able to use NCR 770 self-service banking terminals on-line to NCR's data centers beginning in mid-1976, the company announced recently.

The devices can be used off-line now.

RSTS/E Gains an 'Assist'

MAYNARD, Mass. – Now available from Digital Equipment Corp., Assist-11 was designed to provide on-line display of telephone directory entries for operators.

The software works under RSTS/E on PDP-11 systems.

Multiple operators can have simultaneous access to as many as 20 million directory entries stored on magnetic disk with Assist-11, which provides quick updating as well as rapid response time, DEC said.

License fees for the software begin at $5,000.

Cobol Compiler Audit Routines, Results For Sale

SPRINGFIELD, Va. – Summary results of tests run by the Federal Cobol Compiler Testing Service to validate various compilers [CW, Dec. 24] are now available from the National Technical Information Service (NTIS) here.

For users wishing to run their own tests, NTIS also has magnetic tape copies of the audit routines, a users' guide and a 12-volume set of test specifications organized by function module with the 1974 American National Standard.

The Cobol Compiler Validation System – the magnetic tape of the actual routines – is cataloged as ADA017941 and can be acquired for $500. The users' guide (ADA017940) costs $5 in hard copy or $2.25 in microfiche.

Microfiche copies are available for $2.25 each, NTIS noted from 5285 Port Royal Road, 22151.

NTIS No.	Vandor or Machina Environment	Compiler Identification	Cost*
AD786570	IBM 370/155	V2 OS	$6.50
AD786571	IBM 370/158	V4 VS	$4.00
AD786572	Univac 1106	A6 Exec B	$5.25
AD786573	IBM 360/65	V3.1 OS	$6.25
AD786990	HIS OS2000	V2.1	$4.25
AD786574	CDC CYBER-70	VPOPSR367 Scope	$4.50
AD786575	H6050	WW4.0 NEISOO	$4.50
AD786576	B3500	MCP V5.3	$6.75
AD786989	Computer Ling.	V1.0	$3.75
ADA002115	Univac 1108	Ansi/Ascll Exec B UNI2.2H	$4.25
ADA002486	B6700	MCP II.7	$3.75
ADA010928	HIS 6080	Cobol 2.0/H-EIS*23	$3.75
ADA015189	IBM 360/65	Version 4 R1.2	$3.75

*$2.25 for microfiche.

Validation summary reports on these 1974 Cobol compilers are now availabla from National Technical Information Service.

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Economic Stress on Users Hikes '75 Software Sales

By Don Leavitt
Of the CW Staff

Users were buying more software more willingly this year, but there seemed little if any pattern to new products announced in 1975.

The year to come seems likely to be a lot more of the same. There will still be occasional war stories of things going wrong with outside software, but it's unlikely the mainframers will introduce anything incompatible with the vast libraries of either control or application programs users have developed in-house or acquired from independent software houses.

Ironically, perhaps, it was the generally poor economic environment that led installations to look to outside sources for packaged support.

Over and over again, vendors said they felt buyers were committing themselves because their upper managements were pushing to get more immediate payoff work on their computers quickly.

Budgeting, product control, financial planning and even computer performance evaluation packages were all well received this year apparently, although plain old bread-and-butter accounting application software was also sought out and acquired.

But economic conditions weren't the only things leading users to outside sources. There seems to be a growing sense that the software industry is maturing and that there's a good chance a package acquired from outside will work.

No New Products

The industry's maturity showed itself not only in the way users spoke of vendor support – during installation and when problems showed up later – but in the "new" products introduced during the year. In a general sense, there were no new products.

That statement is unfair to a lot of vendors who did announce innovative software, but it sums up the year in which most of the new products were in fact enhanced versions of packages introduced in previous years.

Time and again, press releases told the glories of Release 17.9 of Xerxes I (and vendor forgive me if I happened to use a real product name in that fatuous example!).

Without demeaning the value of this year's crop of enhancements, they are scattered in impact and quite different from the heavy emphasis several years ago, for example, on independent extensions to IBM's DOS, once that system was "functionally stabilized" by the mainframer.

One pocket of new software that puts the lie to that view, but only in part, is the blossoming of vendors and packages geared to the IBM System/32 which was announced this year and to the business-oriented Digital Equipment Corp. Datssystems built on PDP-8 and -11 hardware.

The packages for the S/32 ranged from IBM's own turnkey Industry Application Programs (IAPs) – but no language processor for in-house programming – for a number of target industries, to generalized accounting systems and the Assembler language processor from Apodictics, Inc. in Ann Arbor, Mich.

Cobol for Minis

The availability of at least some sort of Cobol facility on a range of minicomputers was another mark of 1975. Information Processing, Inc. in Florida has a business system utilizing Cobol on Data General Corp.'s Novas and Eclipse units.

Diversified Data Systems, Inc. in Arizona developed Cobol for Interdata's machines, and Varian Data Machines announced a compiler for its minis. In August DEC said it had Cobol for RSTS/E-based PDP-11s and Hewlett-Packard has had the language on its HP 3000 for some time.

Meanwhile, the year of development in data base management systems (DBMS) was marked by Cincom Systems, Inc.'s introduction of Total on Varian equipment. Quick reactions from Microdata Corp and from HP noted that comparable systems (Reality and Image, respectively) had been up and running on their gear even before the Total-Varian announcement was made.

Review and Forecast

Other data base-mini combinations are in the offing, but the vendors involved are very guarded in what they have to say now.

Full-scale computer users were offered a wide range of data base enhancements during 1975. Software AG's Adabas was made available to IBM DOS as well as OS users, and macro facilities and bill-of-material linkages were also introduced.

Cullinane Corp.'s IDMS also gained a bill-of-material interface during the year while MRI System Corp.'s System 2000 gained a multithread/multiuser facility to speed its operations.

A facility supporting more extensive mathematical computations was introduced as an option to Computer Corp of America's Model 204.

Looking to Codasyl

The most significant support for DBMS may ultimately come, not from any of these particular packages, however, but from action taken by Codasyl, the development group responsible for the Cobol language.

In late spring, it approved a set of procedure division statements to provide direct linkage between a user's Cobol program and his DBMS.

Patent Question

Probably of very little significance to either users or vendors is what the year 1976 holds for patent protection of software. The Thomas R. Johnston record-keeping "invention" now under review by the U.S. Supreme Court will likely be stripped of the protection it won in the Court of Customs and Patent Appeals, but the high court won't answer the basic question of whether any software is patentable.

In any case, even those who think patenting is the way to protect really unique software agree that no more than 1% of all programs would be eligible for such protection.

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More Than 1975 Honor Roll

Report Shows Budget Trends, Package Rating Details

By Don Leavitt
Of the CW Staff

DELRAN, N.J. – A report on "User Ratings of Proprietary Software," recently published by Datapro Research Corp., contains considerably more information than a mere listing of those packages that made up the 1975 Software Honor Roll [CW, Dec. 10].

The ratings for the Honor Roll were based on a survey form Datapro sent out to some 26,000 DP executives. The questionnaire included requests for both user ratings of any software they had acquired – apart from the control software provided with their computers – and budgetary information.

A total of 5,277 users, or 20.1% of the addresses, returned forms, Datapro said, and of these 2,761, or 53%, gave some budgetary figures for their 1974 and 1975 software package expenditures or their expected budget for 1976.

Despite some problems which Datapro acknowledged – not all responses showed figures for all three years – the compilation showed an upward budget trend exists.

Just over 1,500 user sites reported their budgets for 1974 and these averaged $14,879. Just under 1,600 installations expect to spend an average of $21,423 on software in 1976, the report showed.

The largest number of responses, however, was for 1975 figures with nearly 2,000 sites providing budget figures for the current year. Confirming the trend pattern, the average for this midpoint in the three-year span was midway between the other dollar figures, at $17,919.

The budget increases are by no means attributable solely to inflation, according to Datapro. "The 'not invented here' syndrome . . . is dying. Granted, it is not dying quickly or easily, but it is showing signs of a progressively fainter heartbeat," the editor of the report noted.

Users are increasingly aware the use of proprietary software, when compared with the cost and uncertainty of in-house development, has a legitimate place in almost every DP installation, the report continued.

The package-rating portion of the report drew 3,986 responses. More than 1,200 of these covered packages rated by only one or two people – which Datapro disregarded – but 2,772 covered packages rated by at least three users, and Datapro tabulated all of these.

The survey asked users to rate any packages they wished on a four-point scale from excellent (4) to poor (1) in each of seven categories, including one of "overall satisfaction." Than the survey probed how soon, if ever, the packages performed as advertised and what cost, if any, was involved in modifying the software to the user's needs.

The Honor Roll was made up of those packages rated by six or more users that earned an weighted average of 3.5 on "overall satisfaction" and weighted averages of no less than 2.8 on each of five detailed categories.

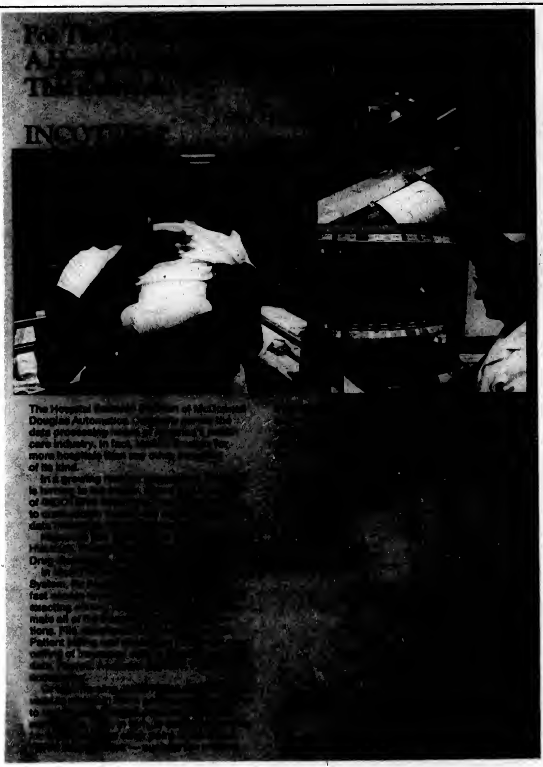
Cost of modification and how soon the software "worked" was not included in the Honor Roll calculations directly, although negative user experience in either of these areas would doubtless have impacted the ratings of the categories that were counted.

Perhaps indicative of why the packages that made the Honor Roll were so highly regarded by their users, however was the overall record of their modification requirements. Across all the Honor Roll packages, 571 users reported no changes were needed, and only 146 said modification was required by either user or vendor.

Fourteen of the packages required no changes and, of the 11 that were modified, the average cost was about $260 – but this included one for which the average cost of modification was reported to be $1,400.

In its comments on the Honor Roll qualifications, Datapro noted the "training" category was not included, but that if it had been and a 2.8 rating required for it as well as the others, 20 of the 25 packages would still be on the list.

Some observers complained that six users is too small a base from which to accord a package meaningful recognition. The report showed, however, that even if the qualifying number were raised to 12, for example, 15 of the original 25 packages would still be on the list, and if "training" were part of the scoring, 13 of those 15 would survive.



'Mark IV' Packaged For Use by Auditors

WOODLAND HILLS, Calif. – A Mark IV system designed for internal auditors is being offered by Informatics, Inc.

Mark IV/Auditor was developed because there was "a lot of demand" for an auditing system separate from the standard Mark IV system, a company spokesman said.

Mark IV is used for the design, implementation and operation of batch and on-line business DP applications without requiring conventional programming methods.

Mark IV/Auditor is a collection of auditing routines which can provide standard aging reports, data valuation, random sampling, stratifications, access to files, automatic sequence and range checking, confirmation notices and extensive matching logic, the spokesman noted.

"Internal auditors previously 'audited around the computer' by confirming totals on files from computer generated reports. With Mark IV/Auditor, they can now audit through the computer by having the system confirm values in the fila", the spokesman said.

The Mark IV/Auditor ranges in price from $12,100 to $18,200. The higher price is for a system containing two special configurations relating to additional files.

Informatics is at 21031 Ventura Blvd., 91364.

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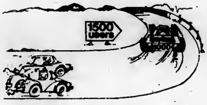

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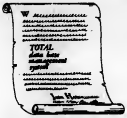
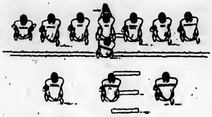


Cincom Declares
Software Independence Day



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1975 has been good to Cincom and . . . apparently . . . to our clients. According to the brand new Datapro Research Corporation survey, "User Ratings of Proprietary Software", our *TOTAL Data Base Management System* received a 3.3 out of a possible 4.0 overall user satisfaction rating, with 90% of the users rating the product Excellent (44%) or Good (46%). And . . . TOTAL had over *3 times* the number of user responses to the survey than the next rated DBMS.

The same survey reported that our *ENVIRON/1 Data Communications System* achieved a 3.2 overall user satisfaction rating (tops for all rated DC systems), with the categories of Thruput/Efficiency, Ease of Use, and Ease of installation leading the way.

We look forward to 1976 with enthusiasm and optimism . . . new products, new installations . . . continuing friendships. If this is your year to move into data base and/or data communications, *make sure* it is a good year by joining the successful 1000-strong Cincom client family.

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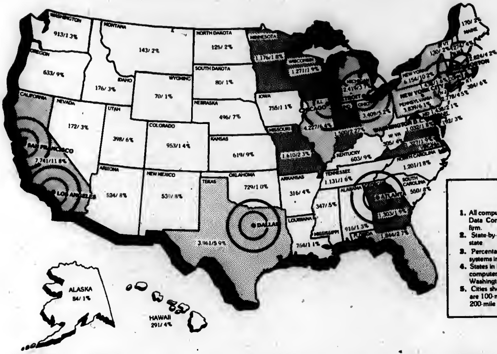

LEGEND

1. All computer figures are taken from projections of International Data Corporation, the world's largest EDP market research firm.
2. State-by-state numbers are number of *computer systems* in state
3. Percentage figures represent percent of total U.S computer systems installed in state, measured by value.
4. States in lighter shading are ten largest measured by value of computer systems installed. States in darker shading and Washington, D.C. are next biggest.
5. Cities shown are 1976 Computer Caravan sites. Inner circles are 100-mile radius from city. Outer circles (where shown) are 200-mile radius from city.

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Measured by value of computer systems installed, the ten largest states in the U.S. (lighter shading on map) account for more than 60% of all computer systems in the United States. Adding the next biggest areas - 7 states and the District of Columbia (darker shading on map) - we get almost 80% of all the U.S. Computer Installations, measured by value. And it's these key states in the computer world which will be host to - or nearby - one or more of the nine cities in the Computer Caravan/ 76 - the travelling computer users' forum and exhibition sponsored by *Computerworld.*

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And thousands of key business executives will take advantage of this opportunity as the Caravan moves across the country. The '76 Caravan can expect attendance of over 30,000, and unlike any other computer show, they will represent the majority of the computer installations in the 17 states and the District of Columbia -- that account for 80% of all U.S. computer systems installed. That's true national coverage.

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Commission Less Forceful in Others

Ruling Against DAA Strongest Decision by FCC in '75

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. – The Federal Communications Commission's (FCC) decision to establish a certification/registration program to replace the Bell-inspired Data Access Arrangement (DAA) will have far-reaching implications as telecommunications users look ahead to 1976.

Users had an indication as early as June that things were going to change. At that time, Walter Hinchman, chief of the FCC's common carrier bureau, said the phone companies were not being hurt by competition.

Irresponsible allegations of economic harm were made by the phone companies at the same time they were making record profits, the FCC official told users at the annual Interntional Communications Association conference.

But the decision to eliminate the DAA is still far from final. AT&T has already filed a request with the FCC for a reconsideration of the ruling. If that fails (as it is expected to), Bell will probably take to the courts in an attempt to overturn the ruling.

Faltered on DDS

And while the FCC made a forceful ruling in one instance, it was less decisive in handling AT&T's Dataphone Digital Service (DDS). The commission set up a two-tier pricing system that made users in the second group of DDS cities pay about 40% more for the same service other users were getting at much lower rates in the five original DDS cities.

Review and Forecast

This dual-pricing arrangement ended Dec. 15, but the FCC failed to solve the original issues that started the controversy. Some regulatory experts still insist that AT&T has set artificially low prices for the DDS tariff.

If, after investigation, these claims prove to be correct, users might be faced with substantial increases.

One regulatory source said the Digital Access Line (DAL) portions of the DDS rates could go up dramatically. A 2,400 bit/sec DAL I line which now costs $65/mo might cost $85/mo and a 2,400 bit/sec DAL II line which now costs $90/mo might cost $110/mo if the commission follows the cost guidelines used by AT&T for other private-line services.

Mileage Rates Up

If the commission ends its DDS proceeding and agrees with this analysis, the mileage rates for users would also rise, the regulatory expert said. At 2,400 bit/sec the cost would rise from 60 cents to $1.55/per mile/mo; at 4,800 the cost for a DAL II would rise from 90 cents per mile/mo to $1.50; and at 9,600 bit/sec the cost for a DAL II would rise from $1.30 to $1.70 per mile/mo.

Users should be aware these increases will occur only if the commission agrees that AT&T's current rates for DDS are too low and that, as a result, the digital service is being subsidized by other phone comany services, the expert said.

Packet-Switched Issue

In the packet-switched service area during the year, the commission still wrestled with the problem of whether this type of service should be regulated. This question raised the broader issue of the interrelationship between computers and communications.

The distinction between the two is becoming increasingly difficult to define, and there have been indications the FCC is ready to open another computer inquiry to deal with this and related issues.

There was little progress in the Justice Department's antitrust suit against AT&T – most of the year was spent haggling over who should hear the case. An FCC position paper on whether it should hear the Justice Department charges was due to be filed with the court at the end of the year.

New Equipment Anticipates IBM's SNA

By Ronald A. Frank
Of the CW Staff

The year 1975 may go down as the period in which communications equipment suppliers tried to prepare users for a newer protocol environment which hadn't quite arrived.

Most suppliers introduced their products with statements guaranteeing compatibility with IBM's Synchronous Data Link Control, even though few such operating sites were identified even by IBM.

And if IBM was considered the equipment leader (which some dispute), the corporation was also having growing pains trying to adapt to the impending emergence of its own defined Systems Network Architecture.

The mid-year reconfiguration of the 3790 terminal system showed IBM could literally change controllers in midstream and alter the entire complexity of a communications subsystem. Having had limited success as a terminal system geared to insurance users, IBM added a key-entry station and made some controller modifications to come up with a data preparation subsystem.

Most significant in that change was the downgrading of an earlier dependence of the controller on the CPU. Instead, the necessary subsystem software resided on a floppy disk in the modified controller.

Little Impact on Users

This flexibility on the part of IBM and uncertainty on the part of independent suppliers did little for communications users. For the most part, they stayed with conventional half-duplex binary sychronous configurations pending more details on the promised full-duplex protocol environment.

IBM also upgraded its 3705 front end with capabilities that were available earlier from other front-end suppliers. The most notable was the ability to support dual CPUs with one 3705.

At the communication shows, diagnostic capabilities were stressed and more data communications users seemed to be installing technical control centers to monitor the performance of their lines and equipment.

The innovative services finally began operation during the year with Telenet providing the first commercial packet-switched service. The Datadial service from the Data Transmission Co. and AT&T's Dataphone Digital Service were also available in limited areas.

But the innovative nature of these offerings were not readily apparent since most users gained access through conventional local loops – which meant the familiar modems.

The new services did make it possible for users to compare costs and, in some cases, there were advantages to switching to the newer offerings. The problem was that these services were still limited in their geographic coverage, which made exact cost comparisons difficult.

Despite the new equipment and services, a survey by *Computerworld* showed the typical network user still used mainly AT&T and transmitted data at 1,200-, 2,400- and 4,800 bit/sec. His biggest problem was maintaining line quality and the typical network included equipment from four or more suppliers.

Itam/16 Allows Remote Entry On 16-Bit Interdata Systems

OCEANPORT, N.J. – Interdata, Inc. has introduced a 16-bit version of its communications software system that allows Interdata 6/16 or 7/16 users to access remote terminals or computers in a manner similar to how they would access a local peripheral, the firm said.

The Interdata Telecommunicatins Access Method, called Itam/16, is said to add data communications capabilities to the Interdata 16-bit processors.

A minimum Itam/16 system includes a 16-bit Interdata processor such as the Model 6/16 with OS/16 MT2 and 32K bytes of memory, a real-time clock, a control console and appropriate data set adapters.

Itam/16 is designed for end users who link their remote minicomputers to a large central computer, Interdata said.

Industrial users will be able to establish hierarchical distributed systems while scientific users will be able to provide system access to remote terminals with the software, according to the firm.

"Itam/16 is a subset of Itam/32 which was introduced earlier for users of 32-bit Interdata computers," Interdata said.

The software is said to provide a device-independent level of communications which accesses remote devices as though they were directly attached peripherals. This level not only supports asynchronous terminals such as teletypewriters and CRTs, but also includes a Remote Job Entry (RJE) package.

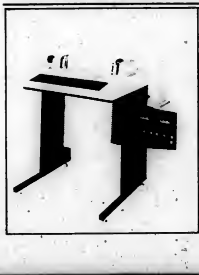
The RJE package allows user to emulate an IBM Model 2780 or 3780 remote terminal. It may also be configured for Interdata processor-to-processor communications.

Itam/16 users are able to read and write to remote terminals from their processors as though they were local peripherals. The user deals only with the data concerning his application because Itam handles line types, protocols and recovery.

Itam is said to accomplish this by inserting or deleting necessary control characters, recognizing and transmitting line control sequences and employing necessary error-recovery procedures.

The Itam is reentrant and reportedly can be used in multiple line configurations.

The software costs $1,200 for immediate delivery from Crescent Place, 07757.



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Singer/MMCI Terminal System Features 4,800 Bit/Sec Speed

ORANGE, Calif. – Singer/M&M Computer Industries, Inc. (MMCI) has an intelligent remote batch terminal system that communicates at speeds up to 4,800 bit/sec with a 300 card/min reader and 300 line/min printer.

Designated the System 525, it is said to cost approximately $115 less than similar systems on a monthly rental basis.

Other available peripherals include a teletypewriter, a CRT, a card punch and interfaces for slower card punches.

The System 525 emulates the Burroughs DC1100, Univac 1004, Control Data Corp. UT200, Honeywell 115 and IBM 2700, 3780 and 360/25 Hasp. Standalone features include card reader-to-card punch and print utilities.

The basic System 525 with an intelligent processer, 300 card/min reader, 300 line/min 132-column printer and maintenance rents for $165/mo on a one-year lease.

Three-year leases are offered at $550/mo including maintenance. Purchase price is $19,990. Singer-MMCI is at 2201 N. Glassell St., 92665.

Development System Combines CRT, Micro

OLATHE, Kan. – Technical Communications, Inc. has a microprocessor development system that provides a communications terminal and microprocessor module in one unit.

Configured around the Fairchild F-8 microprocessor, the M-8 Educator features a 53-key terminal, 31-line CRT, 110 bit/sec teletypewriter-compatible serial I/O, 300 bit/sec teletypewriter-compatible serial I/O and composite video output for use with an optional remote monitor, according to the company.

Options for the system include a firmware-resident assembler, cassette tape storage module and programmable read-only memory programmer, the firm said.

The basic system costs $1,795 and is available from Box 306, 66061.

Serial Data Interface Available From Victor

FRAMINGHAM, Mass. – A serial data interface that has the capability of receiving serial information over communications lines and directly storing the information or transmitting it serially on- or off-line has been introduced by Victor Associates.

The Model VAI 101 was designed to be an interface between serial data sources and paper tape punches or compatible parallel data storage equipment.

It can also be used to interface paper tape readers or compatible parallel stored-data transmission equipment with serial data receivers.

All options are available in the three mounting configurations, Victor noted.

Transmission rates are 110-, 150-, 300-, 1,200-, 2,400-, 4,800- and 9,600-bit/sec for incremental tape readers. Receive rates are 110-, 300-, 600- and 1,200-bit/sec for tape punches.

An internal clock allows individually selectable rates for receive and transmit.

The VAI 101 is designed so various modes of operation can be selected. The unit is priced from $500 to $1,100 depending on options, Victor said from 1400 Worcester Road, 01701.

DEC Course in Package Focuses on Communications

MAYNARD, Mass. – Digital Equipment Corp. has designed a self-paced audiovisual course called "Introduction to Data Communications Concepts."

The course is said to provide generic data communications training for students with only a basic knowledge of computers. It can be used in employee training as well as in vocational and technical schools with computer science curricula, DEC said.

The package includes nine modules on trends, system types, basic concepts, channel concepts, common carriers, terminal equipment, error handling, line control and software.

Audio/filmstrip cartridges come with 10 sets of student workbooks and one set of reference materials.

The package is offered without a playback unit for $1,800 from DEC's Educational Services Department here in Maynard, 01754.

Terminal From Ann Arbor Features Editing Capabilities

ANN ARBOR, Mich. – Ann Arbor Terminals, Inc. has introduced a terminal which it said was designed to satisfy data-editing requirements.

The K2480D batch transmit terminal has an editing option that allows the user to insert or delete not only a complete line of text, but also a line fragment from cursor position to end of line, according to the company.

This characteristic allows rapid text editing with a minimum of keystrokes, the company said.

Wraparound Feature

A text wraparound feature allows the operator to open the text at any point and insert an arbitrary amount of additional data, a spokesman noted.

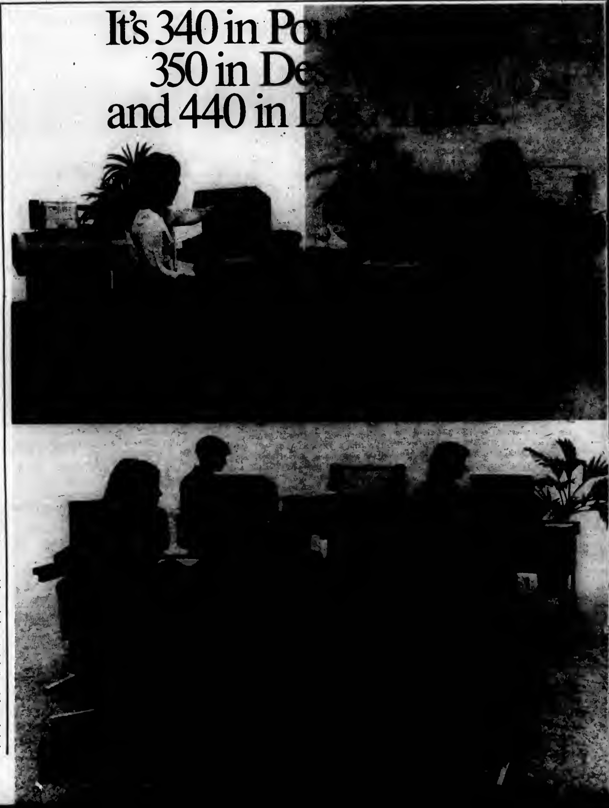
Users can obtain the data-editing capability by adding the option to Ann Arbor terminals already equipped with the Batch Transmit option.

The terminal's editing functions are insert/delete character, insert/delete to end of line, erase to end of line and erase to end of page, Ann Arbor said.

Ascii Output

Output is Ascii-coded, asynchronous serial data with data rates up to 9,600 bit/sec. A 79-key, alphanumeric keyboard is supplied; keyboard codes are upper-case Ascii with 7-bit parallel TTL input.

The K2480D with the editing option and keyboard is $1,795. OEM and quantity discounts are available, with delivery in 90 days, the company said from 6107 Jackson Road, 48103.



Multiplexer Has 16-Bit Micro

ANAHEIM, Calif. – The Remote Intelligent Multiplexer (RIM), which incorporates a 16-bit microcomputer and is aimed at distributed data acquisition and control in processing industries, has been introduced by General Automation, Inc. (GA).

The RIM provides enhanced computational power, capabilities for expanding I/O in the field, communications backup in the event of failure, independence of control and data logging from operation of a host computer and local display of data for startup and maintenance purposes, according to a GA spokesman.

The RIM can accommodate all communications over four twisted-pair telephone-grade cables, a feature which provides savings in cabling costs for processing plants, he added.

In addition, the RIM provides data acquisition and processing power and interrupt servicing at the process, reducing the communications load on a supervisory computer, the company said.

The basic RIM, priced at $5,500, includes a GA-16/220 microcomputer with 8K words of semiconductor memory and a high-speed communications controller which is said to be IBM Synchronous Data Link Control (SDLC) compatible for point-to-point or multidrop networks, GA said.

It also includes a 5-½-in. CRT/keyboard console, a read-only memory loader for exchanging programs and data with a remote host computer and provision for the addition of a wide range of standard I/O interface cards, the company added.

The RIM can be expanded to support all standard GA-16/220 software and operating systems, GA said from 1055 S. East St., 92805.

DEC Adds Six Keyboard Options For LA36 Decwriter II Printer

MARLBOROUGH, Mass. – Digital Equipment Corp. has added six options to the LA36 Decwriter II matrix terminal printer to enhance forms handling and communications capabilities, the company said.

Paper-feeding and formatting options are said to increase the efficiency of terminal performance.

A "top-of-form" option permits the user to choose any of 12 switch-selectable positions to begin printing of an initial line, DEC said.

Other options give the user up to 132 horizontal and vertical tabs per form, signal end-of-paper or paper-jam conditions and initiate automatic line feed after receipt of a carriage return signal, the firm added.

The fifth option available allows both APL and ASI characters to be selected by means of a keyboard switch, DEC said.

The remaining option is an automatic answering feature, protected by a time-disconnect feature, that permits the terminal to respond to incoming calls.

The six options are controlled by several switches and LED indicators on the keyboard. They are available immediately on the LA36 Decwriter II and the LA35 Decwriter II, the receive-only version of the LA36, with the exception of the paper out feature, which is standard on the LA35, DEC's Components Group said from One Iron Way, 01752.

Informer Has Printer For RS-232 Terminals

LOS ANGELES – Informer, Inc. has introduced a pollable, hard-copy printer terminal designed for use with terminals having RS-232 communication interfaces.

Informer's Model H can print 32 char./line in a 5 by 7 dot matrix at a speed of 40 char./sec with 10- or 12 char./in., the company said.

Transmission speed options of 110-, 150-, 300-, 600-, 1,200-, 4,800- or 9,600 bit/sec are switch-selectable, a spokesman added.

Variable Formats

An internal strap permits selection of 7- or 8-bit character lengths, one or two stop bits and odd or even parity, Informer said.

The Model H uses the same line discipline as the Informer Model 302 terminal controller. Dual connectors and drivers facilitate daisy-chaining, the spokesman said.

Models are available for 3-3/4-in.-wide paper, with friction or sprocket feed.

The power requirement for the Model H is 1 amp at 117 Vac, 60 Hz, with different power options available.

The Model H costs $995 in quantities of five and is available in 60 days, Informer said from 2218 Cotner Ave., 90064.

GE Offering Lease Plans For Terminet 30 Printer

WAYNESBORO, Va. – General Electric Co.'s (GE) Data Communication Products Department is offering various lease plans for its Terminet 30 matrix teleprinter.

An 80-column keyboard send/receive (KSR) model is $88/mo on a one-year lease, including maintenance, GE said.

The standard teleprinter includes adjustable pin feed, upper- and lower-case printing, numeric cluster, an RS-232 data set control interface and parity error detection, the company said.

In addition to the KSR model, GE is also offering on lease a send/receive model at $83/mo. Both magnetic tape and paper tape versions of the teleprinter are available.

Lower rates are available for longer term leases of two-, three-, four- and five-year periods, GE said. The printer may also be leased on a month to month contract, the division added from its headquarters here in Waynesboro, 22980.

Digicom Adds Coupler

CAMPBELL, Calif. – Digicom Data Products, Inc. has introduced the AC-312 model acoustic coupler which operates at 1,200 bit/sec with an optional 300 bit/sec capability.

The device is Bell 202-compatible and also includes 5 bit/sec reverse channel capability.

The AC-312 costs $625 from Digicom at Suite E, 280 E. Hamilton Ave., 95008.

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Should the requirements of one location change, our systems can change with them. You can switch terminal models without changing programs, or even retraining operators.

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If you need the advantages of random accessibility, look into the Model 350. The 500,000 "fill-in-the-blanks" characters on its exclusive dual flexible disks let you store customer, product/price and salesman files right at the source.

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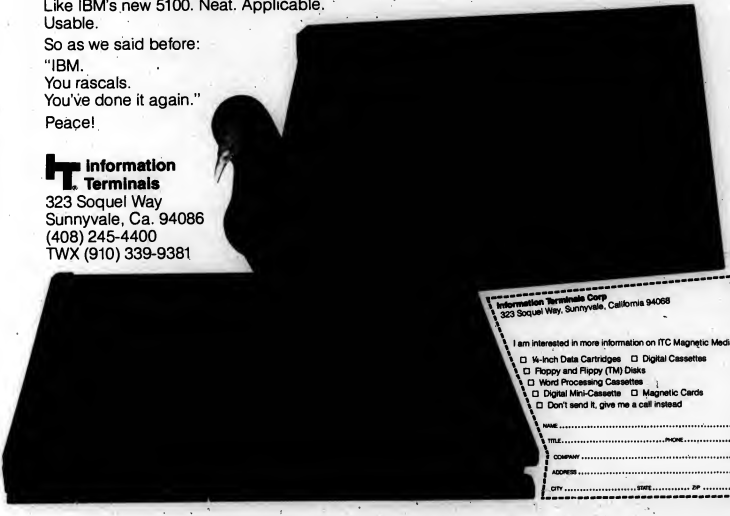

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Review and Forecast

More Users Sit Tight

1975: A Year When 'Newer' No Longer Meant 'Better'

By Patrick Ward
Of the CW Staff

This may have been tha year when users decided that "newer" isn't necessarily "better" in the world of DP.

The forbidding aconomy and disillusionment with the cost/performance ratio of IBM's 370 line drove up demand for IBM 360s and other used computers, third-party lessors said.

Many customers were former 370 users who decided a 360 could handie their applications more economically, the lessors added.

Memorex to Build 3350-Type System

SANTA CLARA, Calif. – Memorex Corp. has begun a devalopment program to build a disk storage system compatible with IBM's 3350 fixed-disk subsystem.

The Memorex 3350-equivalant is plannad "to meet or exceed the performance of the IBM system," a Memorex spokesman said.

Further details are as yet unavailable, the spokesman said.

In both Europe and the U.S., the pace of acceptance of technological innovation has slowed, thus extending the lifa cycle of computers, according to an *EDP Europa* report. Unstable economic conditions around the world are persuading users to hold onto their equipment, the report added.

Third-party lessors and independent peripheral suppliers backed up this trend by offering 3330-equivalent disks and "370" software on 360s, which blurred the distinction between the two IBM series.

Rumors About FS

Rumors spread that IBM's Future Systems (FS) had been either dropped or postponed until 1979 or 1980. Other sources speculated that FS or its successor would be a distributed-processing "traffic cop" that wouldn't replace the 370 at all.

IBM, Univac, Honeywell and Control Data Corp. concentrated on enhancing their large mainframes. The big machines they announced during the year were mostly variants of familiar models.

While the large processor area was fairly quiet in 1975, there was a spate of significant announcements in the disk drive, mass storage, printer and data entry areas.

IBM claimed its 3350 fixed disks offered a significantly better cost/storage ratio than its 3330. Independent suppliers showed their vitality by quickly announcing competitive drives.

CDC launched a competitor for IBM's 3850 mass storage system, and Information Storage System's (ISS) said it had one coming too.

IBM's 3800 laser printing device, which the vendor projected could save some typical 1403 users 30% of their printing costs, was one of tha most novel technological announcements of the year.

The paper cost explosion had noticeably slowed by late 1974, but it servad to heighten interest in computer-output microfilm in 1975.

This is one output alternative IBM has not yet blessed with a product of its own.

IBM did endorse the key-to-disk concept this year with its 3760 keystations, which makes the 3790 terminal system far more of a stand-alone key-entry system than it previously was.

CDC also joined the key-to-disk ranks this year with the announcement of its Cyberdata system.

Four-Phase Systems, Inc.'s Data IV/70 Version 3 distributed processing package emphasized a trend toward on-line entry, updata and retrieval of data on key-to-disk systems.

Inforex's 1300 system illustrated a counter trend, the emergence of small, entry-level kay-to-disk systems aimed at replacing small clusters of keypunches.

Burroughs Corp., NCR and Data 100 Corp. all brought out stand-alona, intelligent data entry devices, offering further competition to keypunches.

The Four-Phase Systams product tied into the much-heralded "distributed-processing" concept, in which machine intelligence in small computers or key-to-disk processors or "smart" terminals share work with larger machines.

The idea is to bring computing power out to the user to catch errors at the source, meet local information needs locally, remove central CPU overhead and cut communications costs with the mainframe.

The pros and cons of distributed processing provoked some of tha liveliest debate in DP conferences this year.

While some observers speculated that groups of low-cost and increasingly powerful minicomputers could replace large-scale mainframes costing many times more, others rejoined that the need to coordinate both the machines and the people who run them was an important liability.

Amdahl Arrives, Xerox Departs in '75

By Patrick Ward
Of the CW Staff

The past year brought a remarkable occurrence – a naw vendor entering the mainframa arena. And tha novelty was heightened by what is becoming a more familiar event – a vendor departing the mainframe scene.

Amdahl Corp., the new entry, offered a machine it said is 100% faster than a similarly priced IBM 370/168. The Amdahl 470V/6, moreover, is said to be software- and hardware-compatible with the 168, so users can keep their peripherals and avoid the cost of software conversion.

The firm "does not intand to build smaller CPUs, nor does it have any immediate plans to . . . sell peripherals or to challenge tha de facto standard of IBM software," Eugene R. White, Amdahl president, said.

With at least two systems already accepted by users and at least three more on order, the Amdahl strategy seems to be working.

The next challenge facing Amdahl (and Japan's Fujitsu, which have provided both financial and technical support) is keeping up with the mainframe announcements coming from IBM and other vendors.

The company may or may not deviate from the path of IBM compatibility when IBM launches the "380," according to Gene Amdahl, founder of the firm bearing his name.

"It depends on whether we can do something better. We'll maka that decision then," Amdahl said.

Xerox's decision to abandon its money-losing mainframe line last July undoubtediy caught some users by surprise.

Xerox users, like RCA and General Electric users before them, were left in confusion about where their hardware and software support was going to come from next.

A flurry of announcements followed from various companies offering to provide some of that support. At year's end, it appeared Honeywell field enginaers would be servicing Xerox machines.

But for DPers of all types, Xerox's exit meant one less option, one less competitor in the computer industry.

User Installs 4M-Byte Memory on IBM 370/165

Special to Computerworld

MILWAUKEE, Wis. – A manufacturer hera chose to extend tha memory capacity of its IBM 370/165 from 3M bytes to 4M bytes rather than buy a new computer to handle its growing workload.

"It is less expensive to expand our capacity this way, allowing us to keep costs down for our customers," said Alan G. Brown, general manager of A.O. Smith Corp.'s Data Systems Division.

"Previously, when customers submitted extremely large and complex engineering programs, we had to run them at night when they would not hurt the service we were providing for all of the regular work," William Kenyon, the division's manager of computer operations, said.

"Now, even though customers are submitting these very large jobs many times during the day, the regular work has not been hurt; in fact, all service has improved significantly."

The modifications allow the division to process an average of 12 separate jobs simultaneously, compared with only nine previously, Kenyon said. "In addition, more memory is available for on-line work, enabling us to improve response time."

Control Data Corp. engineers extended the 370/165 memory through circuitry modifications.

The 370/165 was first installed at A.O. Smith's computer center here in May 1972 with 2M bytes of IBM core. It was upgraded to a 3M-byte system in October 1973 by replacing 1M byta of IBM core and adding 2M bytes of MOS mamory purchased from CDC.

In January, A.O. Smith sold the remaining 1M byte of IBM cora and purchased 2M bytes more of CDC memory. Between January and May, A.O. Smith ran only 3M bytes of the 4M bytes in-house, trying all combinations of 3M bytes on the system.

CDC engineers completed installation of the fourth 1M byte in June and turned it over to A.O. Smith for testing.

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At City Utilities Department

Microfilmed Billing Records Save $50,000/Year

By Patrick Ward
Of the CW staff

RICHMOND, Va. – By producing its monthly billing registers on microfilm instead of on computer printouts, this city's Department of Public Utilities (DPU) saves about $50,000/year in paper costs, storage space and other billing expenses.

Additionally, the DPU staff can now answer customer service inquiries more quickly and easily, which pleases both customers and the DPU staff, William H. Hall Jr., controller of the department, said.

The DPU staff uses the microfilmed secords of 21 different billing cycles, plus daily update listing on microfilm, to deal with customer questions on bills and payments, connects, disconnects, transfers and so on, Hall said.

The department produces the microfilm records on a Memorex Corp. 1600 computer-output microfilm (COM) recorder, which is on-line to the DPU's 768K IBM 370/145.

Awkward Volumes

Until the DPU switched to COM about three years ago, its staff had to contend with "awkward and cumbersome" billing registers made of bound printouts, Hall said.

"Retrieval time was slow, often causing irritation to customers, as well as to employees. Also storage costs were increasing."

With the microfilm cassettes the COM system produces, "we can now store four years of records in two file cabinets," Hall said. "Using paper, the records required a large storage room piled high with printouts," he said.

Retrieval of billing information has dropped from a minute or two to 10 to 15 seconds because of the switch from paper to microfilm records, Hall said.

Each cassette, the size of a 1-in. stack of punch cards, contains the meter readings and billings for about 5,000 to 7,000 customer accounts, equivalent to about 1,200 to 1,400 paper pages.

Twenty-one of these billing registers are produced each month, one for each of the DPU's billing cycles.

An update file containing all the latest connect, disconnect and payment transactions is included in a separate cassette.

Together, the billing register cassette and the daily update file cassette constitute a customer file that is up-to-date through late afternoon of the previous day.

'Practically On-Line'

For this department, Hall said, there is little advantage in changing over to an on-line CRT display system.

"An on-line CRT system costs a great deal more, and our microfilm cassette system is practically on-line anyway.

"Someone is going to have to do a lot of talking to make me want to spend the money to go on-line," Hall said.

"If we had satellite offices located over a large area, as some utilities have, then it might be advantageous to go on-line," he added.

After the microfilm is produced on the COM recorder it is developed in a tabletop unit that automatically threads and processes the complete daily billing register in about five minutes.

Another tabletop unit then duplicates the master file at 2,400 page/min. As many copies as required are made this way.

When needed, a hard-copy printer/viewer provides electrostatic copies of selected accounts. The DPU has a total of 45 Memorex viewers located throughout the department.

Before installing the Memorex on-line COM system, the department evaluated five competing microfilm systems.

Preferred Cartridges

At the time, in late 1972, the DPU decided microfiche sheets were more subject to damage and loss than cartridges. Another type of cartridge required rewinding to the beginning of a roll before removal from the viewer unlike the Memorex system.

With the COM printer available to other city departments, the police and health departments are considering using it for their own purposes.

The city plans to purchase the COM printer and terminate its rental arrangement in the very near future.

The throughput cost entailed in the department's 370/145 driving the COM recorder is less than what an equivalent amount of printer capacity would require, Hall said.

Both the reliability of the COM recorder and the maintenance service for it have been excellent, he concluded.

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Tesdata MS
A New Era in Computer Management

On-Line Entry Reduces Problems in Parts Ordering

Special to Computerworld

PHILADELPHIA – A large wholesale automotive distributor here uses an on-line order entry and inventory control system to lessen some of the problems that commonly arise in this type of industry.

The on-line system has helped reduce the amount of incorrect parts numbers submitted and mistakes in packing the parts the distributor ships, according to Herbert Lipton, president of Kay Automotive Co.

Other benefits include "much faster response to customer inquiries and orders, faster picking and a sizable reduction of lost orders," added Marvin Bogen, vice-president.

The heart of the system is a Univac 9400 real-time computer which is installed at the company's headquarters here.

The computer's 128K-byte memory is supplemented by five Univac 8414 disk units, each with a memory capacity of 29M bytes. The disk units store the parts and customer file information.

Also in the system are two high-speed printers, a card punch, a card reader and three keypunch units. The keypunch units are used to prepare punch cards for those orders received by mail.

Telephone Orders

Orders received over the telephone are now taken by operators using Univac Uniscope 100 CRT terminals linked to a Univac 9400 CPU.

The first task for the operator is to enter the customer's account number into the system for a credit check. This is done by keying in the information on the keyboard. The display will then report to the operator via a message on the screen if the customer's credit limit has been reached, but it will not report the actual amount.

Assuming the credit check is satisfied, the customer's various part numbers are entered into the system. The computer checks the inventory status of each part.

If the part numbers are authentic and they are in stock, an order is entered and the inventory updated to reflect the withdrawal from stock.

Within a few seconds, the system prints out a picking order for the warehouse.

The order form indicates the zone of the warehouse where the part is stored and also states whether the part is supplied in a box with a larger quantity.

When a batch of orders have been printed on a continuous roll, they are separated and then taken to the warehouse for distribution to the pickers.

The order will be picked that evening and delivered the next day to the customer. Some customers in the local area will pick up the parts ordered with their own vehicles from Key's premises.

The transition to the on-line system, which became operational last fall, was a necessity for Kay because of the expansion of the business and the growing number of parts numbers handled – currently in excess of 120,000, Bogen said.

Planning the system took two years. The main goals were to automate as many functions as possible in the distribution process to improve customer service, remove human error whenever possible and keep costs low.

Of the present total of 11 CRTs, six are in the "scope room" where the telephone orders enter into the system; two are on the counter, enabling clerks there to check parts availability while the customer is waiting; two are used by the purchasing department; and the remaining one is kept in the executive office area for use by the company's top executives.

Information on any part number appears within a few seconds on a CRT screen. The information will show the total number of a particular part in stock and also the quantity of that part already ordered that day (this is known as being in "Limbo" status).

To arrive at the true quantity of the part available for sale, the "Limbo" number must be deducted from the total stock number.

If the part number requested has been superseded by another number, the computer is programmed to present the latest number. It can also show the number for equivalent parts produced by other manufacturers if the particular part required is out of stock.

If one or more incorrect part numbers are included on a long order, the computer will automatically spot them and list the bad numbers on a separate order form that can be checked out by the counter sales clerks.

In this way, there is no delay to picking the remainder of the order listing correct part numbers.

Prevents Loss of Sales

One of the key features of the system is that many sales that might have been lost previously because of incorrectly submitted parts numbers can now be saved. Previously, there wasn't enough time to have the pickers attempt to match up the part needed with a bad number.

With the current system, the experienced sales clerks at the counter can go through the "bad numbers" and, in between other tasks, attempt to come up with the correct number by interrogating the computer through the display terminals.

Besides the real-time order entry and inventory status work, the Univac 9400 system performs a number of operations in a batch mode.

Billing is performed weekly. A daily report goes to the purchasing department listing parts out of stock. An automatic replenishment is triggered by the system when the quantity of a certain part in stock reaches a predetermined level.

Other batch applications include sales statistics, commission reports, purchase inventory, sales and customer analyses and general accounting. Monthly reports include a month-by-month record of usage and lost sales.

In Two Years

Key-to-Disk System Doubles Firm's Productivity

Special to Computerworld

CHATTANOOGA, Tenn. – Bancshares Dataline Corp. (BDC), a subsidiary of Hamilton Bancshares, Inc., has virtually doubled its data entry productivity in the last two years, due primarily to the implementation of a key-to-disk system.

BDC has reduced its data entry staff from 25 people to 15 with no reduction in throughput, according to R.J. Denton, vice-president.

BDC provides accounting and DP services for 46 banks: 17 Bancshare banks, 28 correspondent banks and Hamilton National Bank here.

Among the applications processed are demand deposit, commercial loans, real estate, general ledger, factoring, bond accounting, savings, payrolls, stock transfer, financial services and Bank Americard.

Over 500,000 records (averaging 45 char/record) are processed each month on the Entrex key-to-disk system alone.

In addition, BDC maintains a direct communications link with area centers in Nashville and Johnson City, Tenn. These area centers collect data from participant banks in their regions and communicate it directly to BDC's mainframes.

BDC processes this sizable workload on two IBM 370/145s. Prior to March 1973, all data entry was accomplished using 22 IBM 029 and 129 units.

Using the keypunch units, DP personnel had noted several increasingly serious problems preventing optimum productivity:

- Escalating costs.
- Time-consuming operator error-correction process.
- High error rate, necessitating costly mainframe edit runs.
- Complex front-end balancing and preprocessing operations which delayed further processing.

Costs were increasing rapidly, due primarily to increased card costs, escalating paper prices and higher personnel salaries. Error correction on the keypunch equipment was a cumbersome and time-consuming process and the keypunch's lack of edit capabilities meant most errors were caught only in mainframe edit runs.

In addition, since overall DP volume was increasing, front-end balancing and preprocessing operations were delaying other processing.

To solve these problems and to achieve the increased throughput and tighter turnaround times needed to handle this rapidly growing workload, BDC began investigating other means of data entry.

After evaluation of several alternatives, BDC selected an Entrex System 480 with 11 keystations and a line printer. The system was installed early in March 1973.

Immediate results of key-to-disk implementation included the elimination of card costs on converted applications, as well as a significant reduction in the operator error rate, due to the simplicity of the system and its error-detection capabilities.

Mainframe edit run error fallouts were reduced and the average job turnaround time was improved by 25%. Denton attributed these savings to two major factors – a more efficient data flow and the human engineering features incorporated in key-to-disk system design.

Data from the source documents is entered on the key-to-disk equipment; batch balancing and front-end preprocessing are also performed on the Entrex system, concurrent with data entry. From the key-to-disk system, data is output onto magnetic tape for transfer to the mainframe. The final mainframe output is in the form of either hard-copy or microfiche records for member banks.

Data Flow Streamlined

An important key to BDC's data flow is the fact that the key-to-disk system accomplished many functions simultaneously. For example, as data is being entered, the system balances and edits that data, indicating our-of-balance batches where applicable.

Concurrent with this entry/edit/balance function, mailing lists can be updated, labels printed or tapes prepared for the mainframe. Thus, overlapping operations simplify data flow and improve turnaround time.

Concurrent entry and verification capabilities have significantly decreased keying time, since more than one operator can work on the same batch simultaneously. Thus, while one operator is entering a new batch, another operator can already be performing the necessary verification on that batch.

Due to extensive use of the batch balancing and conditional verification features of the system, manual verification has been totally eliminated in some areas and is now performed on an exception basis only.

Repetitive or calculable data is simply generated by the system through output reformatting and data generation programs, significantly reducing keystrokes and contributing to data accuracy.

Most operator problems and/or decisions have been anticipated in system programming, with simple English error messages displayed on the CRT to inform the operator of the exact error or problem, as well as possible alternatives.

Operator Statistics Feature

The Operator Statistics feature is utilized by BDC to stimulate operator productivity, as well as to help supervisors plan time schedules.

System-generated statistics highlight the operators' strongest and weakest applications.

BDC DP personnel then utilize this information for job scheduling.

More productive scheduling in this fashion has helped BDC process over 500,000 record/mo using fewer personnel than with previous data entry equipment.

The key-to-disk system is also used to update customer lists and print mailing labels. A file of customer information is maintained on magnetic tape. At periodic intervals, this data is read onto disk and updated. Labels are then printed on the Entrex line printer, and an updated tape is created and stored until the next mailing.

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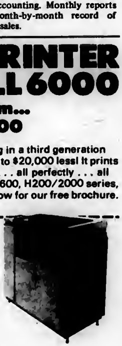

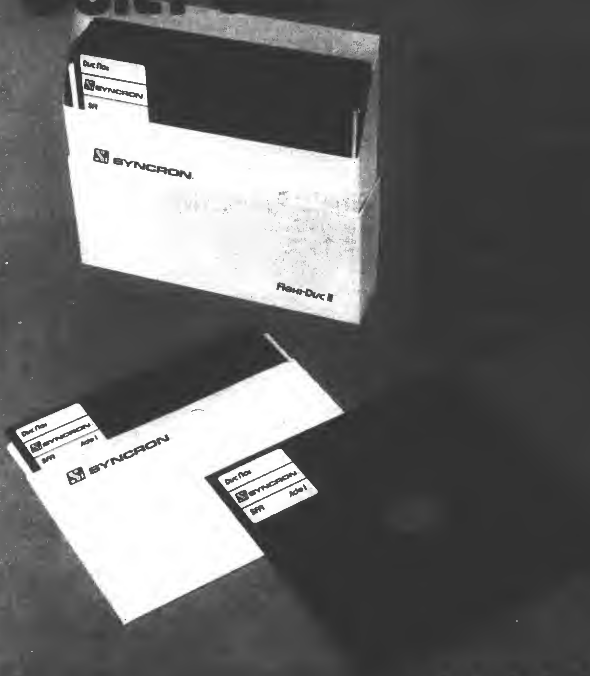

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From Micros to Maxis

Rapid Growth at Top and Bottom of Range Marks Year

By Esther Surden
And E. Drake Lundell, Jr.
Of the CW Staff

The minicomputer explosion continued throughout 1975 with rapid growth both at the top end of the minicomputer catagory through megaminis and at the bottom end of the listing with fast development of microcomputers.

More and more the higher end of the minicomputer classification saw the development of larger systems with full complements of software, which began to interest users who could foresee replacing more traditional mainframes with either single or multiple mini units.

At the lower end of the line, microprocessors began moving into some traditional mini areas, supplying the processing power that OEMs needed to build into their other products.

Possibily the revolution at the lower end of the line saw the greatest number of developments and the most rapid erosion in prices. The extension at the upper end, however, provided more choice and opportunity for end users willing to think small or distribute their data processing load throughout an organization.

And this impetus to the distribution of data processing may well turn out to be the most significant in the long run for the typical end user who has, until now been forced into centralizing his operation around a large mainfram to gain economies of scale.

Review and Forecast

Large Offerings

The year's large system offerings began with the introduction of the Systems Engineering Laboratories SEL 32/55, a machine with 32-bit words and fast floating-point hardware. After that came the Digital Equipment Corp. PDP-11/70 with 32-bit internal data paths.

In March, Interdata's 8/32, billed as four to six times more powerful than the company's 7/32 mini, entered the large system market and was followed by Varian Data Machines V75 at the top of the V70 line.

DEC scored again in April with the XVM systems that greatly expanded the PDP-15 line. The XVMs were said to have a program size capacity four times greater than the PDP-15s and 30% faster execution times.

Harris brought out six packaged computer systems in May. The top of the line this time was the S220, suited, the company said, for multiprocessing applications. In October Harris would introduce the Slash 7 series, billing it as a 24-bit midicomputer.

Digital Computer Controls' (DCC) June offering was a line of minicomputers with MOS memories. The top of the line was the DCC-616, said to feature multibank/multiported memories for the first time in the mini industry.

In October General Automation (GA) introduced its 16-bit "maxicomputer," the 16/440, along with a line extending from microcomputers on up. The 16/440 was described as a "systems programmers machine".

And DEC capped the year by introducing its Super 8 that added a floating-point processor to the PDP-8/A minicomputer.

Mid-Scale Minis

Mid-scale minis were also introduced this year. The SEL 32/50, Harris S100 and S210 packaged systems, DCC 216, 316 and 416 and GA 16/330 minis were announced as part of series that included large-scale systems, allowing the users to upgrade within a series.

In October Data General expanded its line of OEM minis with the introduction of the Nova 3 machines that ranged in size from 4K to 128K and were available with core or semiconductor memories.

The Interdata 6/16, at the bottom of the company's 16-bit mini line, was said to be 30% faster than the comparable 7/16.

The IBM System/32 small business system capped January. DEC introduced Datasystems based on the PDP-8/A and, in March, Data General announced the Eclipse C/300 for dedicated on-line operations within end-user departments of Fortune 500 Companies, the firm said.

The Burroughs L9000 series, introduced in June, was a series of small business machines said to provide double the

(Continued on Page 34)

Interdata Adds Communications, I/O Capabilities to 32-Bit Line

By Esther Surden
Of the CW Staff

OCEANPORT, N.J. – The I/O and communications capabilities of Interdata's 32-bit mini line have been extended through the introduction of Memory Access Multiplexers (MAM), the firm said.

Up to 63 high-speed character-interrupting devices such as magnetic tape drives, CRTs and printers may be connected to each MAM option. Up to seven MAMs may be added to a system.

System throughput is said to be 195,000 char./sec, an increase of some 600%, compared with the 30,000 char./sec rate for present Interdata minis, a spokesman said. The MAM is meant to enhance the 7/32 and 8/32, but not to duplicate an upgrade, he added.

For half-word, 16-bit transmissions, throughput via the MAM multiplexer would be 370,000 char./sec, he continued.

The number of devices that can be hooked up to the MAM is limited to the number of discrete addresses necessary, a spokesman said. A communications modem operating in full-duplex would require two discrete addresses using two of the 63 available addresses.

Two printed circuit boards comprise the MAM, which is connected to both the system memory bus and the system I/O bus. In turn the MAM generates its own bus, the spokesman said. The character-interrupting devices the MAM accommodates are connected to the MAM bus.

The standard controller the customer formerly used on the system I/O bus can be used on the MAM bus, according to Interdata. The MAM bus is functionally and electrically identical to the standard bus, the company said.

Special character recognition for binary synchronous data may be performed by MAM under program control for each device. This indicates to the programmer when to change modes, when to terminate and how many characters to read before termination, Interdata said.

The MAM has three sections, according to interdata.

MAM device control blocks buffer the data, contain the main memory pointers, the character count and a status mask of the particular device.

The processor-interrupt queue stores and identifies up to 255 interrupts until they are cleared by the processor. The read-only memory (ROM) section performs special character recognition, allowing either Ebcdic, Ascii, six-bit or customer-specified code to be selected.

The MAM costs $4,500 plus an individually established installation charge dependent on the user's configuration and is available immediately, Interdata said.

Diablo Disk Drive Series Priced Under $2,500

By E. Drake Lundell Jr.
Of the CW Staff

SAN FRANCISCO – Diablo Systems, inc. has introduced a family of disk drives for small- and medium-scale computer systems it said represents a price/performance breakthrough.

The Series 400 presently consists of eight separate, compatible drives with capacities ranging from 13.3M bytes to 53.3M bytes and is priced from under $2,500 to $3,600 in OEM quantities. Single-unit quantities, however, would be 60% higher, the firm said.

All of the units feature a transfer rate of 5.24 Mbit/sec, and average seek times of around 40 msec, the firm said.

The devices feature a "unique" dual-head-positioning mechanism that is based on an inertial actuator capable of independently moving two head positioners per disk drive..

This allows a user to be seeking with one head positioner at the same time that the other positioner is being used for writing or reading, the firm said.

The units all have the same power requirements and use both removable- and fixed-disk packs. The removable packs are either a 2315-type cartridge in the front-load models or a 5440-type cartridge in the top-loading units, while the fixed disks are 75-mil (3330-type) media, the firm said.

The Model 410 (which, as with all units, comes as either a top-loading or front-loading unit) has a capacity of 13.3M bytes and has one removable disk (two recording surfaces) on the upper positioner and no fixed disks on the lower positioner.

The Model 411 has a capacity of 26.6M bytes with one removable disk on the upper position and one fixed disk (two recording surfaces) on the lower positioner.

The Model 12, with a capacity of 40M bytes has one removable disk and two fixed disks (four recording surfaces) on the lower positioner; the top-of-the-line 413 has one removable disk on the upper level and three fixed disks with six recording surfaces on the lower for a total capacity of 53.3M bytes.

All units have a built-in microprocessor that provides a diagnostic capability permitting the data channel and actuator channel to be stressed using data on each data pack. Further, the service engineer

(Continued on Page 34)

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Based on Minicomputer

Ames 'Guiding Light' Tracks Files Circulating in Firms

SOMERVILLE, Mass. – The Guiding Light system from Ames Color-File Corp. uses bar coding and light pens to keep track of file folders and other items as they move through an organization.

The system can be configured as a stand-alone unit built around Digital Equipment Corp.'s PDP-11/05 minicomputer or interfaced to a user's mainframe, a spokesman said.

Each record is marked with a unique bar-coded number. A request for a record can be entered into the system through keyboards at remote locations throughout the facility.

Location of Record

The location of the record is indicated on a CRT and a request slip is printed out wherever the record is located. The request is posted in the computer, together with time and date.

When the record is removed from the file, the person responsible for logging out recorda sets his light pen to the log-out function and strokes the pen across the bar code. The light pen reada the bar code and the transaction is posted in the computer.

When the record is delivered to the requestor, he acknowledges receipt by stroking his light pen across the bar code. Each light pen terminal is self-identifying to the computer, Ames said.

If the record is forwarded to another location, that transaction is "wanded" to the computer through light pens. The computer automatically posts a time and date to each wanded transaction, thus maintaining an up-to-the-minute accounting of the location of all records in the system, the company said.

Exception Report

Every hour the system printa out an exception report of all records requested and/or logged out but not acknowledged by the requestor. The report is used by the department tracer clerk to identify the problem.

Ames will either sell the user precoded file folders or a device that will allow the user to mark his own folders.

Although originally designed for hospital use, the system can be adapted to any operation that presents a need to track items in a high-volume, high-traffic inventory, Ames said.

Application areas could include trust department records and clipping coupons in the banking industry; claims files in the insurance industry; and unit dosage systems in the pharmaceutical industry.

The system can also track reels and cans of film in the processing and distribution of motion pictures and parts and components in a manufacturing process, the firm said.

The terminals with light pens cost $1,460 each and the system's multiplexer decoder, which can support up to 16 terminals, costs $5,860. Ames is at 12 Park St., 02143.

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(Continued from Page 33)

throughput of previous L series models. And NCR's September entries, the NCR 399-113 and 399-114, were top-of-the-line models for small- and medium-sized businesses.

IBM's 5100 was not introduced until October. The packaged business system could support both Basic and APL. Tektronix then countered with its personal computer with Basic to compete with the 5100.

The move to micros began with DEC's LSI-11 in February. The system was said to execute the 400-plus instruction set of the PDP-11/40.

The GA 16/220 was a micro at the bottom of a line that extended to the "maxi-computer".

The Texas Instruments 9900 series with microprocessor-based minis came out in October. That same month, the Hypercube by IMS Associates, Inc., combined Intel 8080s into an array billed as being able to give large-system users high-processing capability at low cost.

The year came full circle – from micros to minis to midis, then back again to micros hooked together to look like midis.

Diablo Disk Drives Priced Under $2,500

(Continued from Page 33)

can plug in memory and run diagnostic programs to isolate problems down to the functional block in the circuit board, the firm said.

The microprocessor is also used to ensure compatibility between the members of the family without electronic changes.

The unit also offers users a servo track-following positioning system where servo data is prerecorded on each data track and interspersed in the unused sectors between data fields. The recording head aligns itself with this servo data.

Because of this, no special disk pack is needed for head alignment on the system.

The Series 400 uses one AC power source to power both actuators, although they operate independently, and to power one generator power supply, the firm said.

Micro Has Debugger/Monitor

LOS ALTOS, Calif. – Microcomputer Associates, Inc. has a microcomputer with an on-board debugger/monitor.

The basic Jolt card includes an 8-bit CPU that can directly address 65K of memory, two index registers, 58 instructions with 11 addressing modes, two interrupts and both single-step and address-halt capability.

The system costs $249 in kit form and $348 assembled from Pehaco Corp., P. O. Box 1436, 94022.

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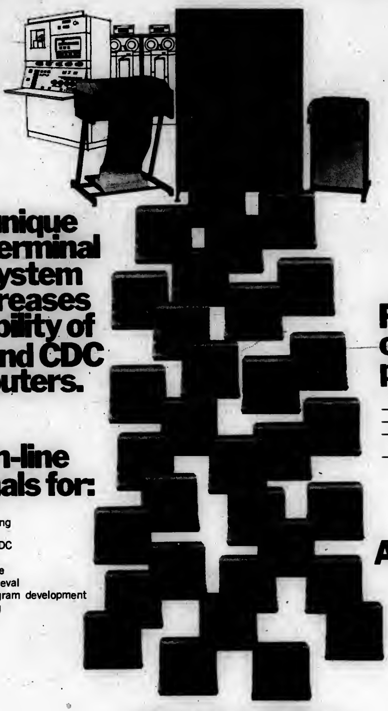

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Batch System Presented Problems

On-Line Order Entry Steps Up Book Distributor's Service

SECAUCUS, N.J. – "If we can make four or five sales to a store between September and November instead of one, we are in clover."

What Leon Amiel, president of Amiel Book Distributors, Inc., meant is that the money is made in repeat business. Amiel Book, which deals in remainders and its own illustrated books, credits titles and service for repeat sales – aside from s promotional push and possibly some other incentives, there is not much a distributor can do about a slow-moving title.

But service is something else again.

Thus, when the company recently reduced delivery time by at least 50%, the target was repeat business. Where it used to take three to four weeks to ship an order, turnaround has been cut to one to two.

In addition, relatively small rush orders (up to 15 line items) can be shuttled through the office and out to the warehouse in 15 minutes. Previously, getting an order to the warehouse in less than a day was difficult at best.

Change of Method

The speed-up resulted from a change in the way Amiel Book processes an order. Using an NCR Spirit on-line order entry system, Amiel Book now enters orders directly. As a result, the paperwork is completed sooner and that, in turn, steps up warehouse picking.

At the same time, "reserve file" inventories are updated: The reserve file is a computer record of some 5,000 titles and 3,000 prints supposedly in stock at the moment.

While the running totals may not be absolutely accurate because of cash transactions and other activity not posted until later, the reserve file is close enough at the time for management purposes.

The system, which features an NCR Century 8200 minicomputer, costs $15,000- to $20,000/year less than the previous batch processing system. And that includes on-line capabilities.

The company, whose origin dates back about 50 years, sells to approximately 10,000 libraries and bookstores across the country.

For all but about a year, Amiel Book was based in New York City, where orders were manually typed and priced. Title descriptions were written out in full.

To further complicate matters and add to the delay, the office was in one location and the warehouse in another. So, besides the tedious paperwork process, there was the problem of moving documents across town.

A batch system was installed but its inventory reporting presented some problems – records were not updated until after the orders were shipped and stock status summaries were one to two weeks after the fact.

The strength of a batch system is its capacity to process a lot of work fast. That, according to Amiel Book, was too much power for a company its size and scope.

On the other hand, an on-line system makes "the best people responsible for the work," Amiel said. Orders are entered into the computer by order clerks and accounts receivable transactions are posted by financial people. The idea is to fix responsibility with personnel having the expertise to shoulder it.

NCR Spirit system is used at Amiel.

Mini-Based System To Print Mail Labels

ST. LOUIS, Mo. – A minicomputer-based system is under development here in an effort to help speed up the often sluggish mail service.

The system being developed by the Electronics and Space Division of Emerson Electric Co. for the U.S. Postal Service is essentially a printing system which has the capability of producing a yearly total of 8 billion labels and slips used to attach to mail bags and bundles of letters with a common destination.

The labels and slips will indicate information such as origin, destination, date and type codes for delivery.

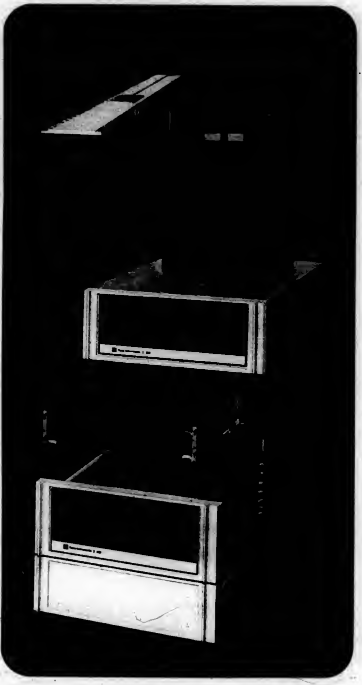
The system will include 11 Varian Data Machines 620L computers, performing three basic functions – production control, file maintenance and print-line control.

With the system, the post office's computerized printing plant for labels and slips will produce a supply for every post office based on its needs.

The necessary data will be stored on magnetic tape and used to produce two-week supplies for each order.

The file computer, also a 620L, will be used to update the list of several million different origins and destinations involved. The 620L computer in charge of production will parcel out the printing workloads taking into account factors such as priorities, availability of lines for production and rescheduling.

It will adjust production to account for malfunctions and put the computer file on-line for the more important function of production should a production or print-line computer fail. The print-line computer will control the actual flow of paper through the printing and cutting processes.



TI's 990 computer family...

The TI concept of what a computer family should be goes beyond producing the most reliable and cost-effective hardware around. To us, that's basic. The extra dimension is usability, and this means software and support.

The TI 990 computer family has all the ingredients. We make every member of the family ourselves, and we make them all software compatible from bottom to top. We also make them the most economical on the market and back them with total TI support, both before and after the sale.

Complete software libraries, as well as memory-resident and disc-based operating systems, support real-time and multi-tasking operations. We offer FORTRAN, COBOL and BASIC languages . . . program development packages with utilities . . . stand-alone software development systems. And we offer cross-support on timesharing networks so you can begin early development of your own applications programs.

The TMS 9900 Microprocessor . . . The Technology Leader.

The advanced capabilities of the 990 family result from a TI milestone in MOS technology . . . the TMS 9900 single-chip, 16-bit microprocessor. It's at the heart of the 990 family, with a unique design that allows for data manipulation that's been hard to achieve with earlier devices. With its high-speed interrupt capability and versatile set of instructions, the TMS 9900 delivers the kind of computing power you'd expect from a 16-bit TTL computer. And it's the best microprocessor going for terminals, machine monitoring and control, and many other applications.

Because the TMS 9900 provides the instruction set for the new 990/4 microcomputer and 990/10 minicomputer, software developed for the low-end computers will be compatible with the higher

Mini Expected to Cut Cable Testing Cost

ST. PAUL, Minn. – A minicomputer system used to test newly developed telephone cable connectors is expected to reduce test time and manpower costs while increasing test accuracy, according to Ralph F. Wickenberg, laboratory supervisor in the Telcomm Products Department of the 3M Co. here.

The real-time Hewlett-Packard (HP) 9602 scientific measurement and control system, recently installed, will administer the thousands of separate tests necessary during connector design development.

Using an HP digital interface multiprogrammer, the mini will step through the test sequence for each connection, applying precise currents, taking voltage drop readings and recording them on magnetic tape, calculating resistance and printing out the results.

The connectors are subjected to accelerated environmental aging for periods of 30 to 170 days to simulate the 40-year service demanded for telephone system applications. Aging is accelerated by high temperature and humidity, temperature shock and cycling.

Other samples are exposed to salt water spray, vibration, current cycling and other adverse conditions.

The resistance change that takes place as a result of these conditions is a measure of connection reliability. In terms of an actual telephone conversation, high or unstable resistances could result in excessive noise, static or a lost connection.

Time-Consuming Manually

The manual method, now obsolete, was tedious and time-consuming. It entailed manual operation of electronic equipment to pass the current through the connector on the circuit board – which may contain a single modular connector handling 25 pairs of wires or 100 discrete two-wire connectors – and to measure with exacting precision the voltage drop.

The voltage drop was recorded on a printed paper tape used to make cards for processing on the company's IBM system. It often took about two days before the results were back, Wickenberg said.

The HP system will enable the division to have its results in real-time with fewer measurement errors, eliminating human errors in transcribing data onto cards and shortening the time for the tests. This will allow the company to bring new connectors to market sooner.

Could Supply Entire System

HP was selected for the task of automating the division's testing, Wickenberg said, because HP could supply the entire system, including all the peripherals and electronic measuring equipment needed.

"When you mix up the companies who supply parts of a system," Wickenberg explained, "you may have difficulty locating the faulty element when you have a system problem. This way, we only have to call one phone number if trouble should develop."

The HP 9602 includes a 2100 processor with 16K memory as well as real-time-executive operating system, according to a spokesman.

Also included in 3M's automated system are an analog-to-digital subsystem, a digital interface subsystem, magnetic tape subsystem, graphics plotter, teleprinter, terminal printer and CRT terminal. The system will facilitate 400 channels for testing.

The 3M Co. expects to cut costs and time spent in testing new connector designs with a minicomputer system.

support, software and hardware

performance models . . . and with a minimum of interface and software adaptation.

Versatile Operating Systems
Coming up with the right kind of software means designing operating systems with as much versatility as you'll find in the hardware. The TX990 Executive Operating System uses the 990/4 microcomputer for low-cost multi-task control with a minimum of peripheral support. Users can select only the function they need for efficient memory usage, leaving more memory available for application software.

For larger 990/10 systems requiring mass storage and rapid access to programs and data files, the DX10 Disc Operating System gives you all you need and eliminates most of the time-consuming work previously associated with system generations. It includes a utility for constructing and testing software, and controls our "Librarian" software package for source and object program files.

Flexible Packaged Systems
TI offers two packaged program development systems and a prototyping system for the user who needs his own stand-alone system for software and firmware development of application programs.

These packaged systems provide a flexible method of implementing early project development. These include the low-priced 990/4 Program Development System and the powerful 990/10 Program Development System. The 990/10 system combines the power of the 990/10 minicomputer with the disc-based DX10 operating system and an extensive set of software development tools. The standard package includes the 990/10 minicomputer with 64K bytes of error-correcting memory, ROM loader and diagnostics, 3.1-million byte removable disc kit with accompanying peripherals, and a complete software development package. And, at $24,500, this system costs at least 20% less than comparable equipment from other manufacturers.

For developing firmware modules, there is a $5950 prototyping system which includes a 990/4 computer with 16K bytes of memory and programmer's front panel, and a "Silent 700*" twin-cassette ASR data terminal. Also, an optional PROM programming kit is available for developing read-only memory.

And, we provide a wide variety of program development utilities for the 990 family. There is communications software that supports either synchronous or asynchronous data transmission, and can operate with the TX990 or the DX10.

Support from the start
In addition to software, the TI 990 family has another kind of support that's basic to every TI computer product. Complete training and applications assistance, plus a nationwide service network backed by TI-CARE†, our remote diagnostic, service dispatching and real-time field service management information system.

For complete details on the new 990 family, call your nearest TI office or write Texas Instruments Incorporated, P.O. Box 1444, M/S 784, Houston, Texas 77001. Or, phone Computer Equipment Marketing at (512) 258-5121.

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TEXAS INSTRUMENTS
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Fabri-Tek Brings Out Core Memory System With 650 Nsec Cycle

MINNEAPOLIS – A minicomputer core memory system called the Model 696 has been introduced by Fabri-Tek, Inc.

The system consists of 16K 18-bit words. Up to eight modules may be used in a single enclosure.

The system is field-expandable to 256K 9-bit words, 128K 18-bit words or 64K 36-bit words.

Full cycle time for the 696 system is 650 nsec; data access time is 250 nsec. The system is compatible with TTL logic and is a direct plug replacement for the Electronic Memories and Magnetics' Micro 3000 series memory, Fabri-Tek said.

System Options

System options include enclosures with built-in expansion capability, power supplies and extender boards.

The system costs $1,664 and is available from the firm at 5901 S. County Road 18, 55436.

Western Tape's Controller Combines PE, NRZI Formats

ANAHEIM, Calif. – A magnetic tape controller that combines PE and NRZI formats on a single board and fits a single slot in Data General Nova computers has been developed by Western Peripherals Corp.

The TC-120 magnetic tape controller includes the board and tape drive cabling. As the TS-120, it includes tape drives and cabling in a fully integrated and tested system, the firm said.

The unit can mix 7-track and 9-track NRZI, PE or dual-density tape units in any combination up to eight units, according to the company.

A 33-word data buffer in the TC-120 gives flexibility in programming data transfer to the computer by relieving the data channel servicing requirements of the tape controller, a spokesman said.

The TC-120 sells for $3,100. Prices for the TS-120 range from $5,500 to $9,600 depending on tape speed and dual or single drive.

The firm is located at 2893 East La Palma, 92806.

Here are some of the companies we'll be keeping at the Computer Caravan 76.

The Bell System

The Bell System will demonstrate how its products and services are solving customers' problems and meeting their needs. By utilizing user's applications, the Bell System will feature the Dataspeed® 40, Transaction* telephone, Vu Set, Dataphone® data sets and network services.

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Key Tronic presents DATAWAND, the handheld OCR system. DATAWAND recognizes eight different character fonts, including OCR-A alphanumeric, MICR, E13B, 1428, and 7B. DATAWAND reads any size form at speeds up to 100 characters per seond and is RS-232 plug compatible.

software ag
OF NORTH AMERICA INC

ADABAS — the Adaptable DAta BAse System — is a generalized DBMS which supports a network of files using inverted file techniques. ADABAS provides data compression, efficient space management, data protection, data security, and host and self-contained language facilities. Over 60 installations in North America.

DATAPOINT CORPORATION

Datapoint will show it's line of Dispersed Data Processing equipment. This includes intelligent terminals, small business computers and a multi-user, multi-task business timesharing system.

All these systems will be running typical business processing programs such as source data entry, and inventory control.

wabash

Wabash Tape manufactures and supplies the following full line of magnetic media; i.e., computer tape, disk packs, flexible disks, digital cassettes, disk cartridges, and magnetic cards. Wabash is located in the midwest with offices throughout the United States and in Canada.

TEXAS INSTRUMENTS
INCORPORATED

Texas Instruments will display and demonstrate models of their 990 Family of micro/minicomputers, as well as models of their Silent 700* Electronic Data Terminal Family.

*Trademark of Texas Instruments.

INTERDATA

Interdata, Inc. will display its 16- and 32-bit computers and Carousel printer terminal — high reliability products with performance, packaging and pricing designed to provide sophisticated OEMs and end users with the most cost-effective tools available for their computing needs.

nci

"Considering the price of SLICK and its performance, there's no reason to pay more for a library system." Bob Martin — CHATTANOOGA ELECTRIC AND POWER BOARD.

SLICK, a true price performance source program library system, costs as little as $78.00 per month.

MEGADATA

Megadata Computer and Communications Corporation will show a complete family of products; the new improved "POWERSCOPE" family of intelligent programmable terminals; the bi-lingual, terminal; the text editing terminal; the color display; the terminal used in the banking community; the touch screen terminal; and a number of peripherals such as floppy disks and peripherals.

AR

Atlantic Research will feature:
- Intershake II, Line Protocol Tester Simulator, speeds to 64 Kbps, enlarged memory.
- Cassette recorder and CRT monitor for Intershake.
- Three bay Network Control System, NCS-100 including rack-mounted Data Tek 9600, Intershake and Analog and Digital Patching/access systems.

Consolidated Computer

"CONSOLIDATED COMPUTER will be displaying the new KEY-EDIT 60 key-to-disk system for small to medium sized users. More than a data entry system, KEY-EDIT 60 has powerful editing, processing and communications features to help distribute the data processing workload."

Si
SYCOR INC

Sycor presents a family of intelligent data entry and processing equipment which you can tailor to the specific requirements of your remote sites — from data entry to communications to remote inquiry/response to on-site report and forms generation.

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COMPUTER INDUSTRY

Although Business Picked Up

Neither Trauma Nor Exuberance Marks Vendors' '75

By Molly Upton
Of the CW Staff

The computer industry observed 1975 with neither trauma nor exuberance. Perhaps most notable this year was the OEMs' tenacious belief that things would improve.

And improve they did. By late summer, most vendors were reporting that business indeed was picking up.

OEMs feel they have managed to stay in the roller coaster car on the downslope through the beginning of the year, through the dim dank tunnel and are now experiencing an upward ride.

For other sectors, such as independent software firms, the economy seemed to have relatively little if any adverse effect.

If anything, users were giving more consideration to buying outside packages. Data base material seemed an especially hot area.

Increased participation of software firms was noticeable at exhibits and conventions during the year.

Elsewhere, many add-on memory makers also credited the recession for increased order rates. Firms that formed units to market to the end user seemed satisfied with their new approach.

Lines Blur

The lines between minis and micros continued to blur, aided in part by several minimakers' announcements of products in the micro realm or very close to it.

Meantime, mini makers, unsatisfied with what had been considered a reasonably well-defined realm, also have decided to poach on the grounds formerly the territory of the larger mainframers, just as many of the latter also came out with smaller systems.

Minis with 3330s, 256K memories and sizable price tags are regarded not as dinosaurs, but as members of the species.

The price of core memory continued to decrease, enabling vendors to offer either bipolar or core, and many mix both in systems, using core for sensitive data users do not wish to entrust to power-failure-sensitive bipolar memory.

More powerful chips are coming down the pipeline from the semiconductor makers, and the industry seems to be adopting the 4K random-access memory (RAM) and frequently passing along price cuts to the users.

It is a matter of time before there is a wide-open race among minimakers for in-house LSI facilities, as the trend toward vertical integration continues.

Intelligence continued to wander further afield from the mainframe into terminals and peripherals.

And makers of intelligent terminals and key-to-disk vendors find themselves coming close to pawing over the same turf. As of now, they say they do not address the same markets, but time will tell.

Software Revenues to Double by '79

NEW YORK – Revenues generated by the software industry should more than double between 1974 and 1979 – from $1.29 billion to nearly $2.8 billion, according to a report by Frost & Sullivan, Inc.

The 1984 revenues should reach $5.2 billion, the report forecast.

In estimating 1974 revenues generated by types of packages and services, special industry and data base services led with $494 million, followed by general packaged services, $312 million.

Standard software packages ranked third with $147 million, followed by industry-oriented applications, $109 million; general applications, $88 million; and systems software, $62 million.

The latter will have an estimated growth rate of 45% to 1979, which should bring revenues to $398 million, moving it into third behind special industry and data base services and general packaged services, respectively.

By 1984, systems software, with estimated revenues of $886 million, will be second only to special industry and data base services, which should bring in $1.17 billion, according to the report.

Breaking down the figures another way, Frost & Sullivan projected packages for credit and banking should generate $389 million in 1979, data base management, $252 million and subsystems software, $236 million.

Fourth is general business at $154 million, with banking weighing in at $85 million and insurance at $43 million in 1979, according to the report.

Independents' Packages

Users rated independents' packages at an average of 3.73 points out of five, while mainframers averaged only 2.7.

Users gave independents a 3.81 chance of success in competing with manufacturers, while suppliers rated their own chances at 3.57.

The principal reason for preferring independents' products was operation and performance, although hardware manufacturers' products were preferred for service and support, the users replied.

The study was compiled from 221 user and 75 vendor responses.

Although vendors overrated the performance operation of their products compared with users' evaluations, vendors gave themselves lower marks than users on maintenance/service, efficiency and documentation.

The performance/operation of products elicited a 3.68 average rating by users and a 4.59 by vendors.

On the other characteristics, vendors and users were within .50 points of each other.

About 76.6% of users indicated they would select the same product again. Packages in the industry-oriented applications area had the highest percentage of negative responses, 21.9%, while standard software had the least, 8.6%.

Frost & Sullivan observed this might be

(Continued on Page 41)

X3T9 OKs Ballot On IBM Interface

SAN DIEGO, Calif. – The American National Standards Institute (Ansi) X3T9 technical committee on input/output interface standards advanced the IBM 360/370 design one step further toward presentation to the X3 standards committee.

The X3T9 committee approved by a vote of 12-3 with one abstention to send the proposal out on a letter ballot to all members of its committee.

Those X3T9 members who object to the proposal are required to detail their objections in writing.

Approval by two-thirds of the committee is required before the proposal is sent to X3, according to Delbert Shoemaker, X3T9 chairman.

Members of X3T9 vote as individuals, he said, and are supposed to consider only technical issues at this level.

When and if the proposal reaches the X3 level, ballots will be cast representing the member companies and the issue will be more subject to political considerations, an observer said.

Once the editing committee makes the changes agreed on at the meeting, the ballot will go out to members. Return is required within 60 days, Shoemaker said.

Japan Liberalizes DP Imports, Extends Foreign Equity in Firms

TOKYO – The Japanese government moved toward increased liberalization of DP equipment imports as well as foreign ownership of Japanese firms in December.

Now it is possible for a foreign firm to own up to 100% equity in a Japanese firm. Previously there was a limit of 49% ownership.

Effective Dec. 25, imports of computer products are under an automatic import quota, which means import approval is granted within a week or so, compared with up to three months before, according to an article in *EDP/Japan Report* (EDP/JR).

However, it is likely the Japanese will seek another method, higher tariffs, to enforce a long-standing principle that foreign DP products should account for only 50% of the market, according to EDP/JR.

Under the old procedure, imports had to go through a governmental screening process which required identification of end users of imported computer products.

The government also required documents indicating the need for machines of foreign manufacture.

When foreign products held more than 50% market share, the government instituted a more rigorous screening process, according to the report.

Industry observers expect the government to continue to attempt to protect native industry by suspending the temporary duty rates applied to CPUs and peripherals and applying the standard duty rates approved by the General Assembly on Trade and Tariff, EDP/JR said.

This would raise rates on peripherals from 22.5% to 25% and rates on CPUs from 13.5% to 22.5%, the report said.

The Japanese government indicated it considers this change as simply a return to the original basic duty rates and not involving any true revision of the duty schedule.

"So far, the temporary duty rates have been adopted as a tentative measure to avoid harassment by the U.S. government, which has been urging the lifting of all restrictions on imports of computer products," EDP/JR said.

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HI Business on Rise Despite Flat Small-Plotter Mart

By Molly Upton
Of the CW Staff

NEWTON, Mass. – Although market projections for the small-plotter business have been flat, Houston Instruments' (HI) business in this segment has been rising, Tom Hall, program manager, said in an interview here.

Since 1968, when HI entered the small ink-on-paper plotter market, it has increased its market share to about 30%. California Computer Products, Inc. (Calcomp), which held about 95% to 98% of the market in 1968, probably has about 50%, with the rest going to four or five other competitors, he said.

Although somewhat arbitrary, Hall said he defines the small-plotter market as those up to about 22 in. or 36 in. wide. Market projections for this segment are about $8 million to $10 million annually, he said.

HI is not structured to handle small quantities at high prices, he said, but rather, likes to compete on price in large volume. Also there is more competition in the larger market, he said.

HI prices its products about 15% to 20% less than Calcomp, he said.

The plotter market "was a bit of a surprise to us. There appears to be a large tendency on the users' part to stick with a product they've seen running in some other location for a period of time," Hall said.

Both Calcomp's 565 plotter, introduced in 1962, and HI's DP-1, which came out in 1968, are still available, he said.

HI has not seen sales peak on the DP-1 yet, he said, although its experience in instrumentation markets indicated sales should have started slacking off three years ago, he said.

Hall attributed the longevity of product popularity to the tendency of customers to stick with a proven and tried product rather than to the lack of new products.

HI's DP-1, its original plotter product, was "bulit like a brick outhouse," he said, as it was designed for use on small ships. It can survive being dropped four feet without a packing case, he said.

This characteristic was probably more important in gaining a foothold in the market than anything else, Hall said.

Most minicomputer manufacturers tend to feel plotters are a nuisance to have to provide, and they don't want to bother with in-house production, contrary to the trend exhibited by many toward vertical integration, he said.

The thought of producing plotters produces a "loud yawn" by many mini makers, he said.

Data General Corp. uses HI as standard equipment on its products, with Calcomp as an option, he said, and Digital Equipment Corp. provides either HI or Calcomp units, he said.

HI units are used principally on minicomputers, Hall said. Electrostatic plotters have made their primary inroads in use with moderately large computer systems, since they require a large amount of core as well as additional storage to run efficiently, he said.

Software for an incremental plotter can operate in 1K of core, he said.

Software Supplied

HI supplies software at no additional charge when it has that software available, he said.

However, in small plotters, the software is not much of a factor as it is universally available, he said. For example, the DEC users group (Decus) offers software, as does Data General, he said.

HI has a line of three ink-on-paper plotters, which it sells both to end users and OEM: the DP-1, 11 in.; DP-3, 22 in.; and the DP-7, 36 in.

These plotters use fan-fold paper as opposed to roll paper, he said, which makes it easier to review plots in the middle of the sheet.

An OEM plotter, the DP-10, uses a single sheet of 11 in. by 17 in. paper and is a "fallout of the firm's X-Y recorder business, since it uses the same frame," he said.

Lately HI has been marketing plotters for use with remote batch terminals, he said. These systems are usually leased because the entire system is on lease, he said. HI has interfaces to the Control Data Corp., Data 100 Corp. and Mohawk Data Sciences terminals, he said.

Although installations in the remote batch are now a small part of HI's plotter business, Hall epects it to grow, based on projections for the overall remote batch market.

Digital plotters account for about 40% of HI's sales, with the remainder from analog X-Y recorders and low-cost analog strip-chart recorders, he said.

As a division of Bausch and Lomb, HI is able to handle its own leases, he said. HI is based in Austin, Texas.

HP Shares Profit

CUPERTINO, Calif. – 'Tis the season. Santa will distribute $11.1 million to more than 25,000 Hewlett-Packard Co. employees as part of the firm's profit-sharing plan. Total disbursement for 1975 is $21.4 million.

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Study Predicts Software Revenues to Double by '79

(Continued from Page 39)

partially because the results of applications packages are more visible than those of standard software packages.

Packages Acquired

Excluding operating systems and other standard systems software packages developed by hardware manufacturers, 81.9% of the responding users acquired a software package or packaged service within the past two years, an increase of 2% from the previous Frost & Sullivan survey in 1972.

These 181 users obtained 487 packages, for an average of 2.7 per user.

The number of packages and services obtained in 1974 rose by 72% over those in 1973, the study indicated.

In 75% of the cases, packages were used daily, and nearly 70% of the packages were used without modification, users said.

Most of the users surveyed were installations with over 1,000 employees. EDP budgets for nearly half were between $1 million and $5 million.

About 85% of the users indicated they spent less than 1% of their annual EDP budget on each package or packaged service.

The findings are skewed toward standard software packages rather than applications packages since the respondent was the DP director, who is not always aware of applications packages purchased by the end user, the report observed.

The number of standard software packages acquired by the respondents was 183, with utilities being the singular most popular category, with 43 packages.

General applications packages totaled 71, with payroll leading the pack with 21.

Systems software packages totaled 36, with data base management systems numbering 22 and self-contained systems, 14.

Hardware dependent/dedicated systems installed 31 packages while there were 25 in the industry-oriented applications category.

Voids in Market

The survey indicated voids in the market.

Forty-one users, of which 20 were in manufacturing, said they were unable to acquire 53 particular packages and/or packaged services.

Almost half the products sought were applications packages; 10 were standard and systems software packages, with most of the remainder being specific items such as bank applications.

Nineteen users indicated the packages or services they sought were unavailable. Most users wanted a package immediately.

But only 39 suppliers agreed there are some partially serviced Industries, and none mentioned transportation or utilities as possible new areas for products.

Twenty-one packages or 19% accounted for 71% of the 487 packages and services acquired by these users during the past two years.

Vendors offer an average of 3.4 items per supplier, the report said.

As a percentage of the selling price of a package, vendors listed the average development cost as 21.9%; marketing, 27.4%; profit, 16.9%; maintenance or service, 16.8%; overhead, 11.9%; and reproduction at 5%.

Vendors indicated the life expectancy for most products is five to 10 years.

How were sales made? In 37.9% of the cases, users selected items by direct sales, with word of mouth the method for nearly 27%.

In all categories of software, suppliers rated their sales forces as the most successful selling technique.

However, within categories there were some variations on the effectiveness of methods. Direct mail got higher marks for application packages than for systems software, the survey showed.

The chief problem in marketing is users' lack of awareness of their product and its capabilities, vendors said.

Other problems were in securing well-qualified sales personnel and users' desire to develop items in-house, the survey indicated.

French Arm of CMC Sold to Dutch Firm

MARINA DEL REY, Calif. – Computer Machinery Corp. (CMC) has completed its efforts to sell its European operations with an agreement to sell 85% of the shares of CMC France S.A. to Telsys Corp. Holding N.V.

Telsys, along with some former CMC Ltd. executives, also bought CMC Ltd. and the German subsidiary.

Telsys has an option to purchase the remaining shares of CMC France and has agreed to buy $9 million worth of products from CMC over the next five years.

No effect on CMC's income statement from the sale is expected because proceeds are about equal to the book value of the French subsidiary plus amounts owing against intercompany debt, the firm said.

In addition, it was agreed the remaining license fees and territorial royalties owed by CMC Ltd., which was sold in 1973, will be prepaid. This will result in a $1 million contribution to profit, the firm said.

CMC has planned its former subsidiaries would become independent distributors and possible manufacturers of CMC products under license agreements.

Talks of the proposed Pertec Corp. acquisition of CMC are proceeding on schedule, a spokesman said.

Univac's ISS Signs to Buy Media Assets of Caelus

CUPERTINO, Calif. – The ISS operation of Univac has signed an agreement with Electronic Memories and Magnetics for purchase of certain of the media manufacturing assets of its Caelus Memories, Inc. subsidiary.

E.T. Bahre, vice-president and general manager of ISS, said the acquisition provides ISS with an excellent internal media development and manufacturing capability to support ongoing disk drive development programs and, in line with future fixed media product plans, reduce dependency on outside independent media suppliers.

The agreement provides for ISS to take over the existing Caelus facility in San Jose with key Caelus development and manufacturing personnel joining ISS.

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So put the Seminar Series to work for you. Whatever your specialty, they'll sharpen your skills - and show you the pitfalls to watch out for, so you can avoid making costly mistakes. They can benefit your installation, your organization - and you.

A list of current seminars is given below. To register for any seminar, or if you'd like more information, just check the appropriate box and send in the coupon.

How to Increase Programming Productivity

A 2-day seminar for technical managers on the state of the art of Software Engineering. Led by John W. Brackett, PhD, Vice President of SofTech, Inc., and Clement L. McGowan, PhD, Consultant. Fees: $300, including continental breakfasts, luncheons, and all course materials. $250 for additional registrants from the same company. Schedule:

New York	**Essex House**	**Jan. 26-27**
Chicago	**Hyatt Regency O'Hare**	**March 8-9**

Legal Tools for Computer Contracting and Protection

A 2-1/2 day seminar that shows you how to increase your advantage in dealing with vendors that supply your installation. Includes discussion and review of your own contracts. Led by Roy N. Freed, the nationally known lawyer, author and educator in the field of computer law. Fees: $325, including continental breakfasts, luncheons and all course materials. $275 for additional registrants from the same company. Schedule.

Wash., D.C.	**Marriot Crystal City**	**Feb. 4-6**
Orlando, Fla.	**Sheraton Towers**	**Feb. 18-20**

Performance Evaluation and Improvement

A 2-day seminar on measurement techniques that are designed to save your installation money. Led by Saul Stimler, author of *Data Processing Systems: Their performance, evaluation, measurement and improvement.* Fees: $250 per registrant, including continental breakfasts, luncheons, and all course materials. Schedule:

San Francisco	**Dunfey's Royal Coach**	**Jan. 19-20**
New York	**Summit Hotel**	**Feb. 9-10**

Data Communications Course #1010 - Practical Data Communications Systems & Concepts

A 2-day seminar on the newest advances in data communications, including SDLC, DDS, new tariffs, equipment characteristics, and the impact of satellite carriers. Led by Dr. Dixon Doll, Teleprocessing consultant. Fees: $350, including continental breakfasts, luncheons, and workbook and reference materials. $300 for additional registrants from the same company. Schedule:

New York	**Essex House**	**Jan. 26-27**
Chicago	**Hyatt Regency O'Hare**	**Mar. 15-16**

Data Communications Course #1020 - Advanced Teleprocessing Systems & Concepts

A follow-up to course #1010, this 3-day seminar emphasizes techniques that minimize operating costs in commercial data communications networks. Also led by Dr. Dixon Doll. Fees: $450, including continental breakfasts, luncheons, and an extensive set of customized course materials. $400 for additional registrants from the same company. Schedule:

New York	**Essex House**	**Feb. 23-25**

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30% Annual Increase Expected

Remote Processing Showing Strong Growth in Canada

TORONTO – Remote DP is growing three times as rapidly as the computer industry in general, David M. Carlisle, vice-president of Datacrown Ltd., said here recently.

This trend, based on extensive use of communications networks, is cnabling DP users to cantralize control and hardware whilc extending computer access to many branch sites, he told a meeting of the Association for Systems Management.

"Remote processing will account for somc $80 million of the $800 million that will be spent on DP in Canada in 1975," Carlisle said.

"Remote processing can be cxpected to increase at 30% annually, compared with a 10% growth ratc for the entire industry," he predicted.

Remote processing is being ancouraged by organizations that have centralized their own facilities and by the increasing reliance on computar service companies offering iarge-scale facilities serving many clients, Carlisle said.

In three years, 42 iarge organizations have converted from their own in-house facilities to Datacrown's shared-processing network, he said.

Remote processing in Canada is following a "significantly diffcrent dircction than in the U.S., where most of the activity has been in the time-sharing and facilities management sectors," he noted.

"Potential users of remote processing have a number of requirements which must be mct by suppliers. They must be assured that their growth requirements will be met; that they enjoy adequate security; that they retain control over scheduling, programming and costs; and that the reliability level meets or cxceeds that of in-house equipment," Carlisle notcd.

The division of responsibilities has become clearly dcfined betwaen clients and suppliers in remotc or shared processing, he added.

The suppliar must look after the computer, systems software, tcchnical support and thc security of client program and data files.

The client's responsibilities includc the systems and programming staff and development of applications, the maintenance of terminaia and staff, preparation of source data and handling of output reports, he said.

International News

Foreign Orders & Installations

The State Services Commission of New Zealand has ordered a Univac 1110 to serva the New Zeaiand Government Departmants of Police and Justice and the Ministry of Transport. The system will initially include 200 Uniscope visual display terinals and 180 attached hard-copy printers.

The British Department of Haalth and Social Security will install a Grafix I optical character reading system from Information International Grafix, Ltd.

Karstadt Co., a West German departmcnt store chain, has ordered a second Univac 494 for pcrsonncl information, commodity control and the automatic calculation of order quantities.

Bank Brussels Lambert of Belgium has ordered a B7700 and B6700 from Burroughs Corp.

The Manitoba Government Computer Centre has ordered a System 2000 from MRI Systems Corp. to support management, administration and research functions.

The Bank of Pusan, Korea, has ordered a Control Data Corp. Cyber 172 system as the nucleus of an on-line banking communications network under davalopment.

National Wcstminster Bank of Great Britain has ordered 100 self-service NCR 770 teller terminals.

The Agua y Energia Electrica of Argantina has ordered five process computars of tha Siemans 300 lina for its load dispatching center under construction.

British Airways has ordered intelligent terminals from Incoterm, Ltd. to access a real-time component control system.

Papiarfabrik Balsthal, a Swiss manufacturar of paper products, has ordared a B2700 computer systam, a TC 4000 printing tarminal and two TD 800 input and display tarminals from Burroughs Corp.

Eurocontrol, an organization involved in European air navigation safety, has ordercd a distributad computer system from Hewlett-Packard consisting of an HP 9700 series system and three satallite HP 9600 series systems.

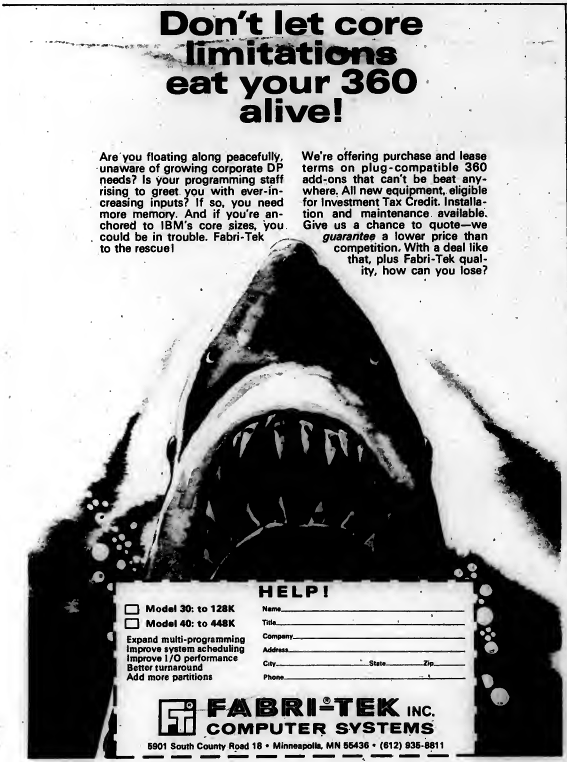
Patroleos Mexicanos, Mexico's government-owned petroleum company, has installed a Control Data Corp. 6400 computar at the aita of recant resource discoveries in southaastern Maxico.

Ford Motor Co.'s European haadquarters in England has ordered four Univac 90/30s.

Copenhagen Talaphone Co. has orderad a Honaywall dual Modal 66/40 to handla all ordars for naw talephonas and billing.

Environmental Elcments Corp., a subsidiary of Koppers Corp., has installcd a Hewlett-Packard 3000CX mini data center to manage in-house purchasing, accounting and scheduling operations.

Tokyo Motor Works, a division of Mitsubishi Motors Corp., has ordered a Univac 1110 to expand its real-time order entry system and astablish a mangamant information control systam.



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Commerce Reports

German Imports of U.S. Machines Rise 20% in '74

By a CW Staff Writer

WASHINGTON, D.C. – Although the German market for business machines increased only marginally in 1974 to $1.84 billion from $1.82 billion in 1973, imports of U.S.-made computers and peripherals rose 20% to $195.2 million in 1974, according to a report from the Department of Commerce.

Imports of U.S. equipment rose another 6.5% in the first six months of 1975, principally from demand for peripherals and calculators, the report indicated.

Equipment imported from the U.S. and other countries totaled 56.7% of the German DP market in 1974 compared with 52.5% in the previous year.

U.S.-made equipment accounted for 37.4% of the German market in 1974. The closest rival was the UK, with imports valued at $80 million, Commerce said.

Broken down by categories, German imports of U.S. hardware rose in all areas from 1973 to 1974 except for central memories sold separately, which declined 2.1%.

Imports of U.S. DP machines in 1974 rose 9.9% to 40,920 units while central units and processors rose 37.2% to 83,594 units.

Peripheral memories rose 15.6% to 169,460 units and represented the largest dollar value at $64.4 million, Commerce said.

Peripherals totaled $36.3 million and CPUs $31.8 million, the report said.

The total installed base of mainframe units in Germany in 1974, excluding smaller systems and minis, was 20,860 units with a value of $8.1 billion, the report said.

Fewer Orders Predicted

"As the recession continues, end users have become suspicious of the 'oversell' which was widely practiced by DP firms in more prosperous times," the report said. "There will be few orders for equipment which is not specifically needed in an enterprise's daily operations."

Sales for DP hardware in 1976, 1977 and 1978 are extremely difficult to predict in the present economic situation, the Commerce Department report stated.

International News

"Knowledgeable sources cautiously estimate an annual growth rate of 6% to 8% for the coming three years, with individual product groups, such as minicomputers and terminals, exceeding that average," it noted.

Best sales prospects for U.S. producta exist for all types of intelligent terminals and certain types of high-performance peripherals, such as fast printers, optical character reading equipment and computer output microfilm, according to the report.

The market for medium-sized and larger systems is beginning to show signs of saturation, the report indicated.

IBM ranked first and Siemens AG second as the major computer suppliers in the German market during early 1974.

IBM increased its number of installed systems 5.5% to 7,386 units and Siemens recorded a 13.6% increase to 2,107 units, according to the report.

According to Diebold Management Report, at the beginning of 1975 the value of installed IBM computers in Germany totaled $4.2 billion and the value of installed Siemens machines totaled $1.7 billion, Commerce said.

From these figures, Diebold calculated IBM holds 51.9% of the market by value while Siemens has 21.3%.

Mini Show Set for Germany

FRANKFURT, W. Germany – The U.S. Department of Commerce is planning an exhibit of minicomputers and microprocessors at the U.S. Trade Center here next October.

Firms interested in participating should contact Edward E. Heiser, Germany/Austria marketing manager, U.S. Department of Commerce, BIC/OIM, Washington, D.C. 20230.

Systems 75 Proves Success to Exhibitors

MUNICH, W. Germany – Systems 75, the German trade fair, was a definite success this year, according to a U.S. Commerce Department poll of exhibitors which showed both national and foreign exhibitors experienced a positive response from attendees.

Sixty-seven firms participating in the U.S. exhibit at Systems 75 realized floor sales of $2.4 million and had one-year projected sales of $63.1 million from the show.

About 98% of all exhibitors established new business contacts, Commerce said.

The number of attendees was up from 9,000 in 1973 to over 12,000 this year, according to the show organizers.

Orders From Eastern Bloc Total $15.3 Million for CII

PARIS – Compagnie Internationale pour l'Informatique (CII) has received orders from Eastern Bloc nations for equipment valued at $15.3 million.

The Soviet Union ordered about $9.1 million worth of equipment, including two Iris 80 mainframes and six Mitra 15 minis.

The order was placed by the import-export agency, Electronorgtechnika, which indicated the machines would be used for "scientific applications" but gave no further details, according to a report in *Computer Weekly*.

CII also received an order for an Iris 80 from Poland's Mera, a large manufacturer of electrical equipment.

They're dedicated, but are they loyal, trustworthy and efficient?

A review of "Dedicated Systems" in our January 26th Supplement.

Many users - especially small and first-time users - face a serious dilemma in this age of escalating technology and escalating prices. They need computing power tailored to their needs to solve specific problems, but they don't have the resources or the staff necessary to develop a system of their own. Systems houses have been playing a significant role in helping users get around this hurdle, because they offer users the hardware, software and systems support they need in one readily available package. The customized configurations provided by the systems houses offer users a maximum amount of computing power with a minimum requirement for professional staff to operate and maintain the system.

In this special supplement we'll be taking an indepth look at systems houses and the minicomputer-based turnkey systems they provide. And we'll be answering some very important questions like these: Who are these systems houses, and what do their services cost? What kinds of problems can they solve, and how do their solutions compare to those offered by the mainframe vendors? We'll review several case histories for specific applications, including tutorials on ways minis can be programmed to solve specific problems.

If you're involved with dedicated systems at your installation, or if you will be in the near future, then you should be reading this special supplement in the January 26th issue of *Computerworld*. And if you're a developer and marketer of turnkey systems, then you should advertise them here. Ad closing is January 9. Contact your *Computerworld* salesman for complete details. Or call Judy Milford at (617) 965-5800.

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Centronics Plans Future as One-Stop Supplier

By Molly Upton
Of the CW Staff

HUDSON, N.H. – Centronics Data Computer Corp. plans to be a one-stop supplier of all printer requirements for firms in the computer industry, Robert Howard, Centronics president, said recently.

Known for its medium-speed printers, the firm's intent is to supply printers from 1,200 line/min down to a teletypewriter replacement, he said.

Centronic's basic business philosophy is to offer products that are either twice as good or half the price of the competition, he explained.

Although not easy, Howard said it is easier and less costly to obtain a decent market share through this philosophy than through playing "me too."

Probably 50 printer companies in the past five years have come and gone, he remarked.

Speaking of the trend to vertically integrate, Howard said he is surprised many companies "haven't done their own thing up to now."

Centronics tries to give the customer the economic justification to buy printers rather than make them, he said.

Many firms that decided to manufacture printers have discovered the lag between design and market time puts them at a disadvantage. These firms then decided to buy their printers, he explained.

Centronics has added at least 10 models during the past year because it is more important now to match the printer more precisely to a system's needs since it is one of the most expensive peripherals, in many instances, Howard said.

Earlier, major customers could use one printer for all applications, regardless of whether the particular printer was more powerful than the job required, he said.

Market to Grow

Howard sees the printer market growing faster than the overall computer industry because of the increasing ratio of printers to terminals.

Whereas several years ago there would be one printer associated with 10 terminals, two years ago the ratio was 1:6, he said, and is now 1:4.

Sam Irwin, president of Sycor, Inc. recently predicted that within a year or two the ratio would be 1:1, Howard observed.

Centronics has an 88 char./sec printer that is price-competitive with most 30 char./sec printers, Howard said.

'Hard to Get Divorced'

"It's easy to get married and difficult to get divorced," and the same applies to selecting an OEM printer supplier, he said.

Through the high commonality of parts, Centronics customers can have six models in the field and stock parts that would normally cover perhaps two models, he said.

In addition, Centronics trains OEM service engineers and "once they're trained on one of our machines, they can service any of our machines," he said.

Centronics also can save OEMs from stocking spare boards because on many of its machines the trouble can be isolated to an LSI chip, which can be replaced.

Centronics' capability in the electronics area is evident in its line of over 30 types of interface as well as a programmable microprocessor interface. This alleviates the burden on the OEM customer of having to design interfaces, according to Hank Weiss, director of marketing.

Today, five years after its introduction, Centronics' principal revenue producer is the Model 101, a 165 char./sec printer. Howard foresees demand for this product flattening out and decreasing as newer offerings become more popular and peak out five years after their introductions.

"I anticipate a product life of 10 years on any of our products," he said. Product life, he explained, means the duration of manufacturing.

Centronics enhances its products throughout the years, he said, which helps sustain the life of the product line.

Blessing in Disguise

"The demise of our relation to Core" – formerly Centronics' distributor in the UK and Germany – "was a blessing in disguise," Howard said.

"It forced us into very quickly and aggressively establishing our presence in Europe, which we have done extremely effectively," he explained.

The level of business three months after starting its own efforts in Europe is greater than it was with Core, he observed.

Centronics now has subsidiaries in Germany and the UK and is in the process of forming one in France. The firm also has distributors in eight other countries.

CW Photo by M. Upton
Robert Howard

CMI Offers Circuit Boards

BEDFORD, Mass. – Cambridge Memories, Inc. (CMI) is offering double-sided flexible and standard printed circuit boads, which it has been making for internal use.

The firm's Circuit Memories, Inc. unit here can provide line widths and spaces as narrow as 1 mil, with boards available in standard bilayer, multilayer and the double-sided flexible print, the firm said.

"We refined our own printed circuit capability in order to continue the development of our Domain Tip [DOT] memory which uses flex print. We've been manufacturing and shipping flex print in DOT memories for over three years," said Dr. Robert Spain, vice-president of the firm's Newtonville Research Facility.

Itel Group Reorganizes

WHITE PLAINS, N.Y. – Itel Corp.'s Data Services Group has been reorganized in a program that expands the DP and Industry Systems divisions into five profit centers.

The program includes new products, new geographic locations and an increased marketing force, according to William H. Bird, group president.

The new profit centers are in the eastern, central and western regions. The Accounting and Business Forms, Inc. and the group's Transportation Management Services company have also been instituted.

Decision Data Starts Unit

HORSHAM, Pa. – Decision Data Computer Corp. has established a Supplies and Service Organization to consolidate and centralize all spare part, supply and service center functions.

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On Software

SIA Plans Tutorials for Caravan Cities

NEW YORK – Shadowing the trend of software commanding more and more of the DP dollars spent today, the Software Industry Association (SIA) will sponsor an industry tutorial on Wednesday afternoons in each Computer Caravan '76 city.

The tutorials will be comparative in nature, discussing how and when to use outside sources of software products and services, according to Lloyd Baldwin, SIA president.

Speakers will look at such things as decentralization of the DP function within a corporation and what it means to the DP manager and to top management, he said.

The tutorials will also examine the life cycle approach to systems development and, in general, discuss the role of software and software management.

The SIA, which is a division of the Association of Data Processing Service Organizations (Adapso), hopes, through these sessions, to show users a way to accomplish their universal DP wish of not reinventing the wheel, Baldwin said.

A different industry figure will lead the hour-long tutorial in each Caravan city.

Rather than representing the marketing function of their organizations, al the SIA speakers are either presidents or senior vice-presidents, sources noted.

The Caravan will mark one of the first occasions on which the SIA, as a group, is represented at sessions of this sort, but Baldwin feels the timing is right.

"The SIA is relatively new as an active group to begin with, and the industry feels very strongly the importance of establishing its professionalism and reputation for dependability as a source for sofware products and services," Baldwin said.

'Adam' Logs In Orders

BURLINGAME, Calif. – Logical Machine Corp., formerly John Peers & Co., Inc., has installed 14 of its Adam small business systems and has 192 on order, according to John Peers, the firm's president.

The system was announced in April 1974. Two of the systems are installed in South Africa, Peers said, and the firm has distributors in South Africa and Australia.

Peers plans to have about six distributors in the U.S. and seven in the rest of the world.

Currently the firm is delivering six machines a month, but that figure should increase to 15 by February, he added.

Peers expects between $3 million to $4 million in sales in the firm's second year of operation.

The Adam system was designed for persons with no knowledge of programming, Peers said. It requires no software and uses English as its language.

Indeserv Offers Upkeep Service

LITTLETON, Mass. – Indeserv, an association of independent service companies, is offering DP firms a plan designed to centralize field service functions and provide nationwide service while minimizing spares inventory and keeping costs down.

The service is jointly provided by Critical Parts Supply (CPS), a division of Federal Express Corp., and Indeserv's nationwide chain of field service centers.

Manufacturers can stock their spares at CPS' central facility at Memphis International Airport, hub of the Federal Express system that extends to more than 10,000 communities nationwide, the company said.

If a machine goes down in the field, the local Indeserv office is advised of the problem by the customer or manufacturer and an analysis of the problem is made.

Direct Ordering

If a part is required, it is ordered directly from CPS. CPS personnel check the inventory status and suggest three alternative levels of service and their corresponding arrival times.

CPS then ships the part to the customer's site or the Indeserv office.

When the part is replaced and the equipment is in operation, the Indeserv technician can either repair the part locally, ship it to a parts depot for repair or return it directly to the manufacturer.

These options eliminate proliferation of excessive inventory and provide better control, Indeserv said.

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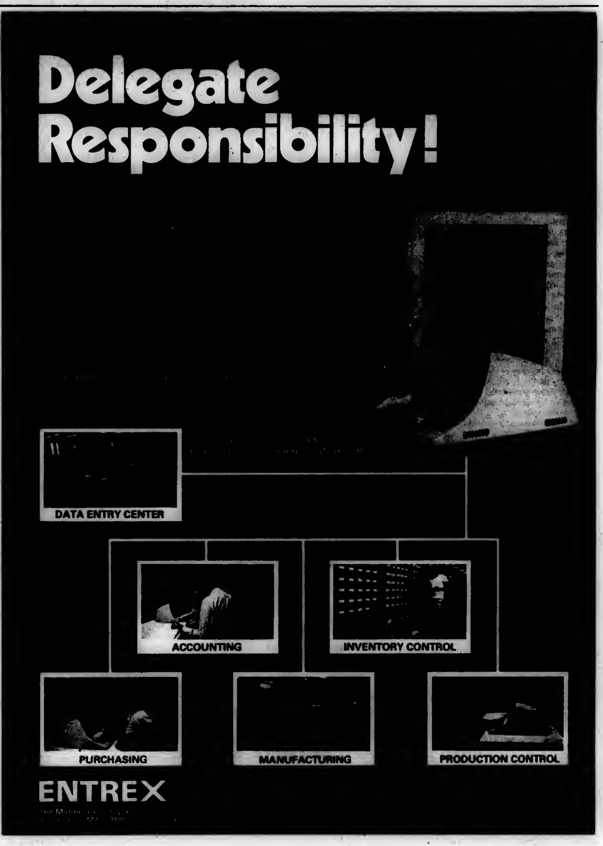

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Services Firms Included in Tour Made by Soviets

A delegation of Soviet technicians interested in learning about American agriculture visited two computer services firms recently as part of their tour.

At Computone Systems, Inc. in Atlanta, the Soviets learned about Computone's services to feed manufacturers as well as livestock and poultry growers.

Feed grain manufacturers use Computone's services on an IBM 360/65 to compute the least-cost formulation of feed that will meet various nutritional requirements, according to Thomas C. Newbill Jr., vice-president of Computone.

The customer inputs the prices he can obtain for various commodities and also indicates his own individual formulas. He receives printouts telling him what ingredients to buy and in what quantity, Newbill said.

Computone, in addition to being a services firm which specializes in applications for the meat-packing and insurance industries as well, manufactures a terminal for use by its customers.

Customers can also use either a Texas Instruments 725 or a Memorex 1240 for output purposes, Newbill said.

At Computer Sciences Corp. (CSC) in El Segundo, Calif., the Soviet delegation observed how CSC's remote-computing network, Infonet, serves the U.S. Department of Agriculture and other federal agencies.

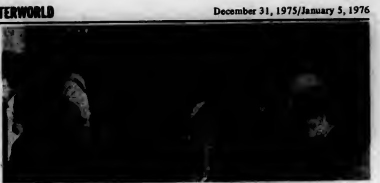
The Forest Service keeps its inventory of timber in the national forests on the network and then determines how much and what kind of timber to cut, as well as when the land should be reforested.

The Department of Agriculture's Statistical Reporting Services on Infonet makes available its monthly report on U.S. crop production.

Paddling With Grumman

WOODBURY, N.Y. – Grumman Data Systems Corp. gave Computer Caravan attendees a chance to register for a prize that was totally unrelated to DP – a Grumman canoe.

Charles Sackett, a programmer from Winona, Minn., was the winner. He promptly took off on a fishing vacation.



More Than a Party

Users gather at one of several Invitational Computer Conferences being held in various locations around the U.S. and arranged by B.J. Johnson & Associates of Newport Beach, Calif.

Upcoming exhibita will be at the Houston Oaks, Jan. 15; Pier 66, Fort Lauderdale, Fla., Feb. 23; Orange County, March 25; and Stouffera Somerset Inn, Cleveland, April 13.

Continuous Forms Use on Rise

WALTHAM, Mass. – General-purpose computer site central batch printers used more than $1.1 billion worth of continuous forms last year and are expected to use in excess of $2 billion by 1980, according to a recent report on the continuous forms paper market published by International Data Corp. (IDC).

The use of stock forms will increase from 62% of the number of original sheets last year to 66% in 1980 as users switch more applications to stock paper to save money and as carbonless paper becomes more popular, the report indicated.

The use of customer forms will correspondingly decline from 38% last year to 34% in 1980.

Shorter lengths and widths of paper than the most frequently used 14-7/8 in. by 11 in. size will be more in demand, reflecting attempts to cut paper costs, the study said.

Last year the average large site used about 13,5 million original sheets of paper, the average medium site 3.6 million, the average small site under 1.4 million and the extra small site 700,000 sheets, according to the study.

Prices Increased

Forms paper prices increased 50% in 1974 because of a shortage of popular types of continuous forms and because of inflation, the study said. During the first quarter of this year prices remained stable as the demand fell.

However, during the second quarter prices decreased about 10% because of regional discounting by paper companies, the report indicated.

In response to this overall 40% increase, the following actions have been taken: over four-fifths (84%) of the surveyed sites reported they were attempting to reduce paper expenses by using computer-output microfilm (COM) in place of printer paper, reducing the number of reports, reducing the amount of paper used per report and/or minimizing the prices paid for paper.

In spite of these actions, continuous forms use will grow as the number of installed computer sites grows and as the volume of print applications increases at the current sites, IDC said.

Field Engineer Wins Mini

NEW YORK – Robert Pingicer, a field engineer here, won an XLO 3100 minicomputer in a drawing sponsored by American Used Computer at a recent conference.

Pingicer had been planning to take a course to learn how to build a minicomputer, so he was especially pleased to be able to skip the course.

Pingicer said he had never won anything before, but registered at the urging of his service manager.

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95 Other:

TITLE/OCCUPATION/FUNCTION

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13 Treasurer/Controller/Finance Officer
21 Director/Manager of Operation/Planning/ Administrative Service
22 Director/Manager/Supervisor DP
23 Systems Manager/Systems Analyst
31 Manager/Supervisor Programming
32 Programmer/Methods Analyst
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52 Other Sales/Marketing
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Teleprocessing Systems Programmer

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Minicomputer Systems Programmer

Responsibilities include selection, implementation and maintenance of a nationwide minicomputer system for remote on-line inquiry, local processing and data entry. Requires 3 years experience in systems design with a background in minicomputer software development. Knowledge of TP software, IBM 370 OS software and experience with COBOL and ALC programming also required. IMS, HASP and Intercom a plus.

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Requires minimum 2 years experience in COBOL and large scale IBM or equivalent equipment. Apply your expertise in one of the largest, most complete Computer Installations in the West . . . utilizing three 168s OS/VS2 . . . going to MVS in February, 1976. Our salary and benefits are excellent . . . our environment exceptionally stimulating. Extremely generous relocation allowance. Please send your resume, including salary history, to

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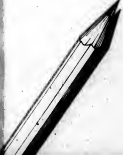

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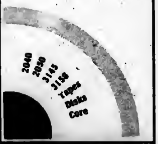

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Communications Firms Report Banner Year

Two communications makers, Milgo Electronics Corp. and Codex Corp., had banner years for the period ended Sept. 30.

Milgo's earnings jumped 56% and Codex had its fifth consecutive record year.

Milgo's revenues for the year rose 31% to $40.4 million compared with $30.8 million last year.

Earnings reached $4.2 million or $2.50 a share compared with $2.7 million or $1.64 a share last year.

The fourth quarter showed earnings rising to $993,246 or 57 cents a share compared with $605,941 or 37 cents a share in the year-ago period.

Revenues for the quarter totaled $10.3 million compared with $8.2 million during the same period last year.

For the year, modem sales totaled $23.5 million; modem leases, $15.1 million; other revenues, $860,000; and other income, $947,000, the firm said.

At Codex, earnings for the year rose to $4.4 million or $3.01 a share from $3.9 million or $2.06 a share last year, when there was a $950,000 tax credit.

Earnings before special credits rose 48%.

Revenues jumped to $26.2 million compared with nearly $18 million in 1974.

For the last quarter of the year, Codex earnings totaled $1.1 million or 68 cents a share compared with $1 million or 70 cents a share in the same period last year.

Quarterly revenues totaled $7.2 million compared with $5.6 million in the year-ago period.

Arthur Carr, Codex president, said the gains in new product announcements, specifically the 6000 series of intelligent network processors, along with the firm's operating lease base, production capability, working capital and net worth support the "further development of Codex Corp. to its planned position as the leading supplier of data communications systems."

Boothe Nine Months Continue Profit

SAN FRANCISCO – Boothe Computer Corp. continued its trend of profitability in the third quarter and nine months and revised its estimates of profits from computer leasing operations.

Over half of the quarter's earnings were from the leasing operations, and the firm now expects to earn profits from this segment of the business through 1978.

Leasing operations accounted for $150,000 of earnings.

For the quarter, Boothe earned $205,000 or 5 cents a share compared with a loss of $1.5 million during the same period last year.

Revenues rose to $12.9 million from $9.7 million in the same 1974 period.

Nine-month earnings totaled $4.2 million or $1.06 a share compared with a loss of nearly $3 million last year.

Most of the 1975 period rise was from the gain from extinguishment of debt which, after a charge in lieu of income taxes, was $3.8 million.

Revenues for the nine months rose to $36.8 million compared with $31.2 million in the same period last year.

As of June 30, Boothe extinguished its debts to Finance-America Corp. of $17 million.

Modcomp Grows In Nine Months

FORT LAUDERDALE, Fla. – Earnings and revenues climbed during the third quarter and nine months at minicomputer-maker Modular Computer Systems, Inc. (Modcomp).

For the quarter, earnings reached $526,000 or 18 cents a share compared with $522,000 or 19 cents a share during the year-ago period.

Revenues rose to $9.5 million compared with $6.8 million in the same 1974 period.

During the nine months, Modcomp earned $1.7 million or 56 cents a share compared with $1.6 million or 62 cents a share in the same period last year.

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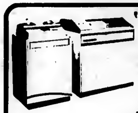

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Earnings Reports

TYMSHARE
Three Months Ended Sept. 30

	1975	a1974
Shr Ernd	$.30	$.23
Revenue	14,064,251	11,756,223
Tax Cred	.....	22,000
Earnings	1,173,407	845,738
9 Mo Shr	.91	.65
Revenue	42,058,573	34,352,716
Tax Cred	125,000	143,000
Earnings	3,499,620	2,426,214

a-Restated to reflect United Data Centers acquisition on pooling-of-interests basis.

TRACOR
Three Months Ended Sept. 30

	1975	1974
Shr Ernd	$.60	.....
Revenue	26,567,000	$24,053,000
Disc Op	.....	(1,004,000)
Spec Item	a742,000	(352,000)
Earnings	1,485,000	(764,000)
9 Mo Shr	1.65	.51
Revenue	75,743,000	68,588,000
Disc Op	.....	(996,000)
Tax Cred	2,025,000	602,000
Earnings	4,068,000	1,254,000

a-Tax-loss carryforward.

BARRY WRIGHT
Three Months Ended Sept. 30

	1975	a1974
Shr Ernd	$.24	$.23
Revenue	9,920,552	10,934,655
Earnings	386,570	372,799
9 Mo Shr	.70	.76
Revenue	31,017,559	33,686,169
Earnings	1,142,814	1,238,989

a-Restated to reflect change to Lifo accounting for about 50% of inventories.

TELEX
Three Months Ended Sept. 30

	1975	1974
Shr Ernd	$.15	$.02
Revenue	24,935,000	27,355,000
Tax Cred	609,000	.....
Earnings	1,675,000	221,000
6 Mo Shr	.34	.04
Revenue	52,443,000	56,850,000
Tax Cred	1,244,000	.....
Earnings	3,547,000	386,000

TRW
Three Months Ended Sept. 30

	1975 (000)	a1974 (000)
Shr Ernd	$.60	$.70
Revenue	629,800	630,200
Earnings	21,700	25,200
9 Mo Shr	1.87	2.01
Revenue	1,905,700	1,838,700
Earnings	67,400	71,300

a-Restated to reflect Lifo accounting.

MODULAR COMPUTER SYSTEMS
Three Months Ended Sept. 30

	1975	1974
Shr Ernd	$.18	$.19
Revenue	9,539,000	5,795,000
Earnings	525,000	522,000
9 Mo Shr	.56	.57
Revenue	27,245,000	17,807,000
Tax Cred	.....	185,000
Earnings	1,557,000	1,598,000

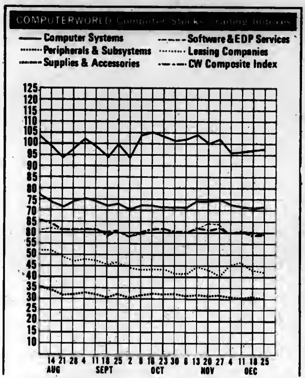
WANGCO
Year Ended Sept. 30

	1975	1974
Shr Ernd	$.90	$1.54
Revenue	20,600,000	18,300,000
Earnings	950,000	1,572,085
3 Mo Shr	.43	.41
Revenue	5,300,000	5,500,000
Earnings	455,000	444,735

WANG LABORATORIES
Three Months Ended Sept. 30

	1975	1974
Shr Ernd	$.17	$.22
Revenue	15,095,000	a15,754,00
Earnings	682,000	578,000

a-Restated.



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Computerworld Stock Trading Summary

CLOSING PRICES TUESDAY, DECEMBER 23, 1975

All statistics compiled, computed and formatted by
TRADE★QUOTES, INC.
Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		PRICE 1975 RANGE (1)	CLOSE DEC 23 1975	WEEK NET CHNGE	WEEK PCT CHNGE
A	BURROUGHS CORP	82-105	85 1/4	0	0.0
C	COMPUTER AUTOMATION	2- 11	9 5/8	+ 3/8	+4.0
A	CONTROL DATA CORP	11- 23	17 3/4	+ 1/8	+0.7
N	DATA GENERAL CORP	10- 35	30 3/8	0	0.0
O	DATAPOINT CORP	8- 26	21	- 1/4	-1.1
C	DIGITAL COMP CONTROL	1- 4	1 1/2	0	0.0
A	DIGITAL EQUIPMENT	44-140	132 5/8	+2	+1.5
N	ELECTRONIC ASSOC.	2- 3	1 7/8	- 1/8	-6.2
A	ELECTRONIC ENGINEER.	5- 10	7 1/2	+ 1/8	+1.4
N	FOXBORO	23- 42	26 1/4	-1 1/2	-5.4
O	GENERAL AUTOMATION	4- 14	5 1/4	+ 1/8	+2.4
O	GRI COMPUTER CORP	1- 1	1/2	0	0.0
A	HEWLETT-PACKARD CO	58-120	93 3/4	-1	-1.0
A	HONEYWELL INC	22- 40	32 1/2	+ 3/8	+1.1
N	IBM	158-228	220	+ 1/4	+0.1
C	PERCPED	1- 10	7	0	0.0
O	MICRODATA CORP	2- 10	9 1/2	0	0.0
C	MODULAR COMPUTER SYS	5- 15	5 3/4	- 1/2	-8.0
N	NCR	15- 35	22 1/8	- 5/8	-2.7
O	PRIME COMPUTER INC	2- 4	3 3/4	- 1/4	-6.2
A	PERKIN-ELMER	16- 30	20 1/2	-2 1/8	-9.3
N	RAYTHEON CO	26- 55	45 3/4	+1	+2.2
N	SINGER COMPANY	5- 17	9 3/4	+ 1/8	+1.2
N	SPERRY RAND	24- 49	35 1/8	+1 3/8	+3.8
A	SYSTEMS ENG. LABS	1- 5	5 1/4	+1	+23.5
A	VARIAN ASSOCIATES	7- 18	11 7/8	0	0.0
N	WANG LABS.	7- 17	9 5/8	- 1/8	-1.2
R	XEROX CORP	47- 88	50 1/8	+2	+4.1

LEASING COMPANIES

EXCH		PRICE 1975 RANGE (1)	CLOSE DEC 23 1975	WEEK NET CHNGE	WEEK PCT CHNGE
C	COMDISCO INC	1- 3	3 1/2	- 1/4	-6.6
A	COMMERCE GROUP CORP	2- 4	2 1/4	0	0.0
A	COMPUTER INVSTRS GRP	1- 2	5/8	0	0.0
P	DATRONIC RENTAL	1- 1	1/4	0	0.0
A	DCL INC	0- 1	1/4	-	-20.1
N	DPF INC	3- 8	4 1/2	- 1/8	-2.7
O	EDP RESOURCES	1- 2	1	0	0.0
A	GRANITE MGT	1- 5	4 1/2	0	0.0
A	GREYHOUND COMPUTER	2- 3	2 1/2	0	0.0
N	ITEL	3- 9	5 1/2	+ 1/8	+2.3
N	LEASCO CORP	4- 8	5 1/2	- 3/8	-6.3
C	LEASPAC CORP	1- 1	1/4	0	0.0
C	LECTRO MGT INC	1- 1	1/8	0	0.0
O	MRG INC	0- 4	3/8	0	0.0
A	PIONEER TEX CORP	2- 7	5 1/8	+ 1/4	+5.1
A	ROCKWOOD COMPUTER	1- 1	1/8	0	0.0
N	U.S. LEASING	7- 14	6 3/4	- 1/4	-3.5

EXCH: N=NEW YORK; A=AMERICAN; R=PHIL-BALT-WASH.
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
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SOFTWARE & EDP SERVICES

EXCH		PRICE 1975 RANGE (1)	CLOSE DEC 23 1975	WEEK NET CHNGE	WEEK PCT CHNGE
C	ADVANCED COMP TECH	1- 1	7/8	- 1/8	-12.5
A	APPLIED DATA RES.	1- 10	1 1/2	- 1/8	-7.6
N	AUTOMATIC DATA PROC	29- 65	53	-1 1/4	-2.3
C	BRANDON APPLIED SYST	1- 1	1/8	0	0.0
C	COMPUTER DIMENSIONS	2- 8	2 7/8	- 1/8	-4.1
O	COMP ELECTION SYSTMS	3- 7	5 1/4	+ 1/2	+10.5
C	COMPUTER HORIZONS	1- 1	3/8	- 1/8	-25.0
C	COMPUTER NETWORK	1- 3	1 5/8	0	0.0
A	COMPUTER SCIENCES	2- 4	4 1/8	+ 3/8	+10.0
C	COMPUTER TASK GROUP	1- 1	5/8	0	0.0
C	COMPUTER USAGE	2- 4	3 3/8	+ 1/2	+17.3
C	COMSHARE	2- 4	2	- 1/8	-5.8
O	DATATAB	1- 2	1	0	0.0
A	ELECT COMP PROG	1- 1	1/8	0	0.0
N	ELECTRONIC DATA SYS.	11- 20	11 3/4	+ 3/4	+6.8
C	INFORMATIONAL INC	1- 1	1/8	0	0.0
C	IPS COMPUTER MARKET.	1- 1	1/2	- 1/8	-20.0
C	KEANE ASSOCIATES	2- 3	2 1/2	- 1/8	-4.7
C	KEYDATA CORP	2- 4	2 7/8	- 1/8	-4.1
O	LOGICON	3- 5	3 3/8	0	0.0
A	MANAGEMENT DATA	1- 3	1 5/8	0	0.0
A	NATIONAL CSS INC	4- 14	11 3/8	+2	+21.3
O	NATIONAL COMPUTER CO	1- 1	1/8	0	0.0
A	ON LINE SYSTEMS INC	8- 17	14 1/2	+1 5/8	+12.6
R	PLANNING RESEARCH	2- 6	2 3/4	- 1/8	-4.3
C	PROGRAMMING & SYS	1- 1	1/2	0	0.0
C	RAPIDATA INC	2- 5	3 1/2	- 1/2	-12.5
O	REYNOLDS & REYNOLDS	10- 24	13	- 1/2	-3.7
C	SCIENTIFIC COMPUTERS	1- 1	5/8	0	0.0
O	SIMPLICITY COMPUTER	1- 1	1 1/4	0	0.0
C	TYMSHARE INC	7- 11	10 5/8	- 5/8	-3.2
A	URS SYSTEMS	2- 4	3 1/4	- 1/8	-3.7
R	WYLY CORP	2- 4	2 3/8	- 3/8	-13.6

PERIPHERALS & SUBSYSTEMS

EXCH		PRICE 1975 RANGE (1)	CLOSE DEC 23 1975	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	4- 9	7 1/4	- 1/4	-3.3
O	ADVANCED MEMORY SYS	1- 7	4 1/4	+ 3/8	+9.6
R	AMPEX CORP	3- 7	4 5/8	- 1/8	-2.7
C	ANDERSON JACOBSON	1- 3	1 5/8	0	0.0
O	BOENIVE MEDICAL ELEC	1- 5	3	- 3/8	-11.1
A	BOLT,BERANEK & NEW	5- 13	8 7/8	0	0.0
N	BUNKER-RAMO	4- 8	3 3/4	+ 1/8	+3.4
A	CALCOMP	3- 7	3 3/8	+ 1/8	+3.8
O	CAMBRIDGE MEMORIES	1- 5	1 7/8	0	0.0
N	CENTRONICS DATA COMP	7- 25	19 3/8	+1 3/8	+7.6
C	CODEX CORP	15- 30	27 1/4	- 3/4	-2.6
C	COGNITRONICS	1- 1	5/8	- 1/8	-16.6
C	COMPUTER COMMUN.	1- 2	7/8	0	0.0
O	COMPUTER CONSOLES	3- 7	4	0	0.0
A	COMPUTER EQUIPMENT	1- 2	1 1/8	0	0.0
C	COMPUTER MACHINERY	1- 2	7/8	- 1/8	-12.5
C	COMPUTER TRANSCEIVER	1- 2	3/4	0	0.0
C	CONTEN	2- 5	3 1/8	0	0.0
N	CONRAC CORP	12- 30	23 1/4	-3 5/8	-13.4
C	DATA ACCESS SYSTEMS	1- 3	2	0	0.0
O	DATA 100	5- 16	8 5/8	-1 5/8	-15.8
A	DATA PRODUCTS CORP	2- 8	4 1/2	+ 7/8	+24.1
O	DATA TECHNOLOGY	1- 3	1 1/8	0	0.0
C	DATUM INC	1- 2	7/8	0	0.0
O	DECISION DATA COMPUT	2- 7	2 5/8	- 1/4	-8.6
O	DELTA DATA SYSTEMS	1- 1	1/8	0	0.0
O	DI/AN CONTROLS	1- 1	5/8	- 1/8	-16.6
N	ELECTRONIC M & M	1- 3	1 1/8	- 1/8	-10.0
C	FABRI-TEK	1- 1	5/8	0	0.0
C	GENERAL COMPUTER SYS	1- 2	1 3/4	- 1/4	-12.5
A	HAZELTINE CORP	3- 4	2 7/8	- 1/4	-8.0
N	HARRIS CORP	18- 34	33 5/8	+1 3/4	+5.4
A	INCOTERM CORP	3- 12	8 1/4	+ 1/4	+3.1
C	INFOREX INC	2- 5	2 5/8	- 1/8	-4.5
C	INFORMATION INTL INC	8- 14	9 7/8	- 1/8	-1.2
A	LUNDY ELECTRONICS	3- 4	4 5/8	- 3/8	-7.5
C	MANAGEMENT ASSIST	1- 1	5/8	0	0.0
A	MILGO ELECTRONICS	8- 24	19 1/4	+ 1/4	+1.4
A	MOHAWK DATA SCI	1- 5	3 1/8	0	0.0
C	OPTICAL SCANNING	1- 3	1 1/2	0	0.0
C	PENRIL CORP	1- 2	3/4	- 1/4	-25.0
O	PERTEC CORP	2- 8	3 3/8	- 1/2	-12.5
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
C	PRECISION INST.	1- 1	3/8	0	0.0
C	QUANTOR CORP	2- 8	4	+ 1/8	+3.2
O	RECOGNITION EQUIP	2- 5	3 1/8	0	0.0
N	SANDERS ASSOCIATES	3- 11	6 3/8	+ 5/8	+10.8
O	SCAN DATA	1- 3	2 1/8	+ 3/8	+21.4
C	STORAGE TECHNOLOGY	8- 17	10 1/2	+ 3/8	+3.7
O	SYCOR INC	5- 22	17 1/4	- 3/4	-4.1
O	T BAR INC	3- 8	6	- 1/4	-4.0
C	TALLY CORP.	1- 5	2 1/2	+ 1/4	+11.1
C	TEC INC	1- 4	1 3/4	0	0.0
N	TEKTRONIX INC	18- 45	42 3/4	-1 1/2	-3.3
N	TELEX	1- 3	1 7/8	- 1/8	-6.2
C	WANGCO INC	4- 12	10 1/2	+2 1/8	+25.3
O	WILTEK INC	1- 4	1	0	0.0

SUPPLIES & ACCESSORIES

EXCH		PRICE 1975 RANGE (1)	CLOSE DEC 23 1975	WEEK NET CHNGE	WEEK PCT CHNGE
C	BALTIMORE BUS FORMS	4- 5	4 1/4	0	0.0
A	BARRY WRIGHT	5- 7	5 3/8	+ 1/8	+2.3
O	CYBERMATICS INC	0- 1	3/8	0	0.0
A	DATA DOCUMENTS	29- 42	29 3/4	+ 1/2	+1.7
C	DUPLEX PRODUCTS INC	12- 25	17 3/8	+ 7/8	+5.3
A	ENNIS BUS. FORMS	5- 7	5 3/8	0	0.0
C	GRAHAM MAGNETICS	5- 10	9	+ 1/2	+5.8
C	GRAPHIC CONTROLS	8- 21	12	+ 1/4	+2.1
N	3M COMPANY	49- 68	55 3/8	-3 3/8	-5.7
C	MOORE CORP LTD	39- 51	48 1/4	-1 1/4	-2.5
N	NASHUA CORP	9- 22	10 1/2	+1	+10.5
C	STANDARD REGISTER	11- 20	18	- 1/4	-1.3
C	TAB PRODUCTS CO	4- 8	4 1/2	0	0.0
N	VARCO	17- 24	19 7/8	0	0.0
O	VANIER GRAPHICS CORP	4- 7	4 3/4	0	0.0
A	WABASH MAGNETICS	3- 5	3 5/8	0	0.0
A	WALLACE BUS FORMS	15- 23	18 1/4	- 1/4	-1.3

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If you rent a system 370, we can purchase it and lease it back to you at considerable savings on a short-term operating lease. Just send us your installed configuration with purchase quotations.

If you already own your IBM system, perhaps you'd like to sell it to us at market price.

Or if you have an IBM system on order, we can provide you with the same system at substantial savings.

Whatever your situation, we'd like to talk. Contact Mike Swords at DPF Inc., 141 Central Park Avenue South, Hartsdale, N.Y. 10530 (914-428-5000). Or call any of our regional offices listed below.

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